A Dissertation on

A COMPARATIVE STUDY ON OUTCOME OF STAPLER VERSUS HAND SEWN ANASTAMOSIS IN ELECTIVE GASTRO INTESTINAL SURGERIES

Dissertation Submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

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M.S. GENERAL SURGERY

BRANCH – I

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI, TAMIL NADU.APRIL - 2013

CERTIFICATE

This is to certify that the dissertation entitled **"A COMPARATIVE STUDY ON OUTCOME OF STAPLER VERSUS HAND SEWN ANASTAMOSIS IN ELECTIVE GASTRO INTESTINAL SURGERIE"** is a genuine work done by Dr.S.SADASIVAM, for the partial fulfillment of the requirements for **M.S. Branch – I (General Surgery)** Examination of the Tamilnadu Dr.M.G.R. Medical University to be held in APRIL 2013. Under my supervision and the guidance of **Prof.Dr.S.VISWANATHAN** Department of General Surgery, Government Stanley Medical College and Hospital.

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DECLARATION

I, **Dr. S.SADASIVAM,** solemnly declare that dissertation entitled, **"A COMPARATIVE STUDY ON OUTCOME OF STAPLER VERSUS HAND SEWN ANASTAMOSIS IN ELECTIVE GASTRO INTESTINAL SURGERIES"** is a bonafide work done by me in the Department of General Surgery at Govt.Stanley Medical College & Hospital, Chennai, under the guidance of. **Prof. S. .VISWANATHAN, M.S.,** Additional Professor of Surgery, unit Chief, Government Stanley Medical College and Hospital, Chennai-600 001.

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Place : Chennai.

Date :

(Dr.S.SADASIVAM)

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CONTENTS

INTRODUCTION

In gastro intestinal surgery after rection of bowel loops, anastomosis of the bowel loops is the central part of the gastro entrology. Sero muscular suture technique is the main stay of theGastro intestinal sugery which is described lembert in 1826.

Single layer extra mucosal anastomosis is the more commenly used now a days which is described by Matheson of Aberdeen because of which has the capacity to produced least tissue necrosing or luminal narrowing.which has to replaced to catgut and silk now a days

The stapler devices recently introduced and this helps anastomosis of bowel loops with less tissue injury and ased time duration of procedure.it also dcreases the anastamotic leak complication

For the past years stapler technique commonly used many of the surgeons ,its more useful than the hand sewn anastomosis for safety,easily accessibility,duration of procedure, efficiency.

This study compares the hand sewn anastomosis with stapler anastomosis and it conducted in our govt Stanley hospital .so stapler technique is commonly used in many surgical deparment and widely accepted.

Many surgeon having doubt regarding the stapler , how its used in critical sites, regarding 100% water with air anastomosis. Hand sewn statics made over stapled anastomosis it will protect the anastomotic site.

AIM OF THE STUDY

The purpose of the presentation is to compare the feasibility safety and efficacy of the outcome of stapler and hand sewn anastomosis in elective gastro intestinal surgeries.

REVIEW OF LITERATURE

INTESTINAL ANASTOMOSIS may be created between two segments of bowel in a multiple ways.thesubmucosal layer of the intestine provides the strength of the bowel wall and must be incorporated in the anastomosis to assure healing.

The choice of anastomosisdeponds upon the operative anatomy and surgeons preference.acurateappromaximation of two well vascularized , healthy limbs bowel without tension in a normotensive , well nourished patient almost always results in a good outcome.

Anastomosis is the highest risk of leak or stricture are those that are in the distal rectal or anal canal, involve irradiated or diseased intestine or performed in malnourished , ill patients.

A key concern is to prevent leakage at the anastomosis site and subsequent peritonitis, but this complication can be avoided if the procedure is done correctly and preventive measures are taken.

Anastomosis done by hand sewn ,stapling method , may be anastamotic devices used. It can be donr with omentalization or seroal patch graft it may give strength to the anastamotic site or it will improve the vascularity and it reduces the risk of post operative leakage

INDICATION OF INTESTINAL ANASTOMOSIS

- Tumor.
- Ischemia or incarceration.
- Trauma or perforation.
- Fistula.
- Ulcer or bleeding.
- Obstruction.
- Stricture or Crohn's disease.

CONTRA INDICATION OF INTESTINAL ANASTOMOSIS

ABSOLUTE CONTRA INDICATICATION

- Poor blood supply to bowel ends (ie, radiation-injured bowel).
- Unclear bowel viability after a revascularization procedure.
    - Both ends of the small bowel may be brought up to skin level as temporary ostomies if the distal small bowel is involved. A proximal small bowel ostomy will create a high-output fistula that is difficult to manage.
    - Alternatively, both ends can be stapled closed and a plan made for a second-look laparotomy in 24–48 hours.
    - In extreme situations (eg, acute mesenteric ischemia with gangrene extending from the ligament of Treitz to mid colon), the likelihood of survival is very small. This is an absolute contraindication to attempted resection and anastomosis.
- Inadequate tumor margins.

- If a tumor is unresectable, and small bowel obstruction is likely to occur, a side-to-side anastomosis in uninvolved bowel proximal and distal to the obstruction may be performed as a bypass procedure, leaving the tumor in situ.

RELATIVE CONTRA INDICATION

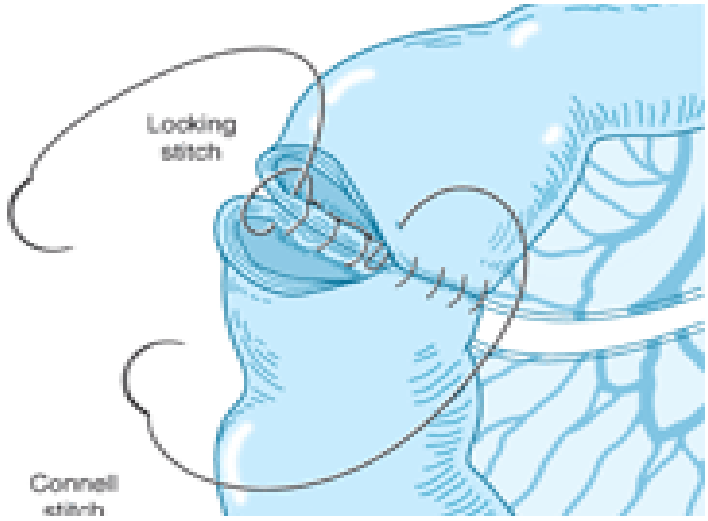
- Peritoneal sepsis.
- Hemodynamically precarious patient.
- Extensive Crohn's disease.
    - Stricturoplasty should be considered to minimize the need for extensive resection and risk of short gut syndrome; 90 cm is the approximate shortest length of small bowel that might still support a viable oral nutrition program.

HAND SEWN ANASTOMOSIS

Is the the most commen method to be used in intestinal anastomosis because of the immediate availability, less cost of suture material

FAMILIYARITY WITH THIS PROCEDURE

It consists of single layer, two layer anastomosis and all sutural material can be used. single layer may used interrupted or continuous stitiches



In case of double layer anastomosisinner continuous and outer interrupted layer can be used and it has the following technique

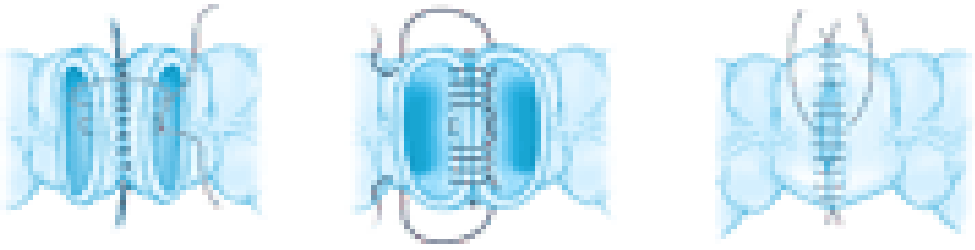
- The two bowel ends are to be anastamosed are alighned next to each otherby aligning the non-crushingbowel clamps

- Two corner suture are placed in serosa and muscularieslayer andstitiches tied and tagged with a straight clamp. The needle and suture is transacted distal to the clamps

- Interrupted seromuscular sutures (Lembert stitches) are placed between the stay sutures of using 3-0 silk with an approximately 3-mm gap between two sutures. Lembert stitches should includes only the seromuscular layer. Sutures are tied gently, not excessive tension to prevent cut through of seromuscular layer. This forms the posterior outer layer.

- Next, a Connell stitch is made in both ends. The Connell stitch is made by passing the suture from the outside in, then inside out, on one end. The same step is repeated on the other end in the form of a continuous U-shape. The suture is tied so that the knot is outside.

- The posterior inner layer is completed by taking interrupted full-thickness stitches using 3-0 vicryl starting from the near end. The sutures are tied sequentially so that the knot lies inside the lumen



- The needle must be pulled through each edge separately. Trying to include both edges in one pass of needle can prevent the surgeon from taking a full-thickness bite on both edges. It is necessary to include submucosa carefully because it is the strongest layer of the bowel wall and gives strength to anastomosis.

- The anterior inner layer is completed in a similar fashion starting from the far end. The pouting of mucosa is prevented by taking a small amount of mucosa and a large part of the seromuscular layer, which results in inversion of mucosa.

- Anterior outer layer completed with taking interrupted lambert stitiches through the sero muscular layer

Although single layer anastomosis has theriotical advantages over the double layer both can used commonly and in clinical practice both equally efficacious but in double layeranastomosis has the following disadvandatages

- Decreased luminal circumfrence
- sub mucosal apposition will be poor
- Avascular necrosis
- Healing time time will be more

SUTURAL MATERIAL

The ideal suture material used in intestinal anastomosis is produced minimal inflammation and minimal tissue reaction and it producedmaximam strength of the anastamostic site

It may

- Absorbable(PDS,VICRYL) or non absorbable
- Monofilamentor braided

Monofilament suture material commenlyused multifilament not commonly used because it may promote inflammation

Avoid nonabsorbable suture material because it may produced

- luminal extrusion,and
- foreign body reaction

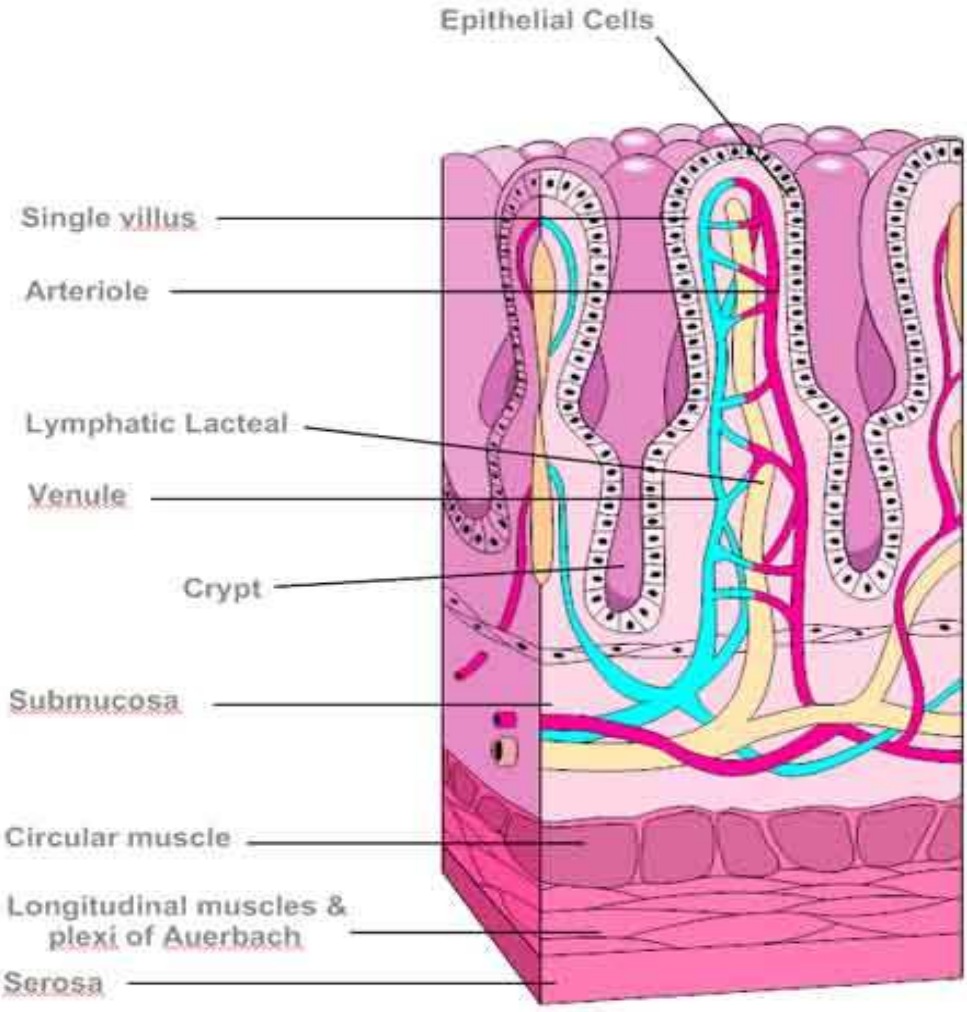
Tapercut needle which is the most commonly used needle in gastro intestinal anastomosis,it have a round shaft ,cutting point of tip it can penetrate both delicate and dense tissue,

It can penetrate easily submucosal layer, which is the holding layer of the intestine.

PATHOPHYSIOLOGY OF HEALING OF ANASTAMOTIC SITE

Hand sewnanastomosis healed by primary intention,in case of stapler anastomosis healed by secondary intention.

Submucosa is the most important layer of the bowel wall because it have more strength of the wall.



Bowel wall containing three main layer;

- Inner mucosa
- Middle submucosa
- Outer serosa

When suturing the bowel loops the serosa will sutured properly .because it has better holding capacity than the other circular or longitutidinal layer.

In some areas peritoneal reflection were absent ,those areas has less vascularity ,so its heals poorly,eg; esophagus,rectum

It has more difficult to anastomosis than the other intra peritoneal bowel loops. Stomach and small bowel has rich blood supply ,then its heals rapidly.

Intestinal anastomosis has three phases;

- acute inflammatory (lag) phase,
- a proliferative phase,
- aremodeling or maturation phase.

Within the three layer of bowel loops sub mocosa is the more important layer, because it contain collagen.

Collagen is the most important factor to determine the anastamotic healingCollagen derived from trophocollagen,and will hydroxylation with proline, eill produced hydroxyl proline.

Hrdroxyproline is the most important element to produced three dimensional structure in collagen, and it has give more strength

Vitamin C is helps hydroxylation , som its deficiency will produced less anastamotic healing

The degree of fiber and fibril cross-linking relates to the maturity of the collagen and is probably important in determining the overall strength of the scar tissue.

Collagen synthesis is depends on the balance between synthesis and metalloproteineas enzymes. This enzymes degrades the collagen maximum at 3rd post operative period, so which is the main factor to determine anastomosis

After surgery from first post operative day starts collagen degradation and its extends upto 7 thpost operative day. So in that period

anastamotic leak will be more commen.afterthat due to the increased collagen scar got more strength.

Collagenase is enzyme will degradsthe collagen, in the inflammation. Collagenase increased due to the decreased activity of collagenase inhibitor.

STAPLER ANASTOMOSIS

Stapler first introduced by hultl,humer,(Budapest) in 1908. But their use has been grown since the introduction of new and reliable disposable,instruments in the past 32 years

The anastamotic leak,wound infection,wound dehiscence,mortality,anastamotic stricture,is more commen in stapler anastomosis than the hand sewn anastomosis. Grena uses broad range of mechanical stapling in his modern surgery.

Maechanical devices follows

- circular staplers
- linear staplers
- linear cutter staplers

DISPOSABLE CIRCULAR STAPLER

The circular staplers widely used in general surgery for following anastomosis

- end to end anastomosis
- side to end anastomosis
- side to side anastomosisit can also used in thoracic surgery,surgical treatment of obesity,and in colo-rectal surgery.

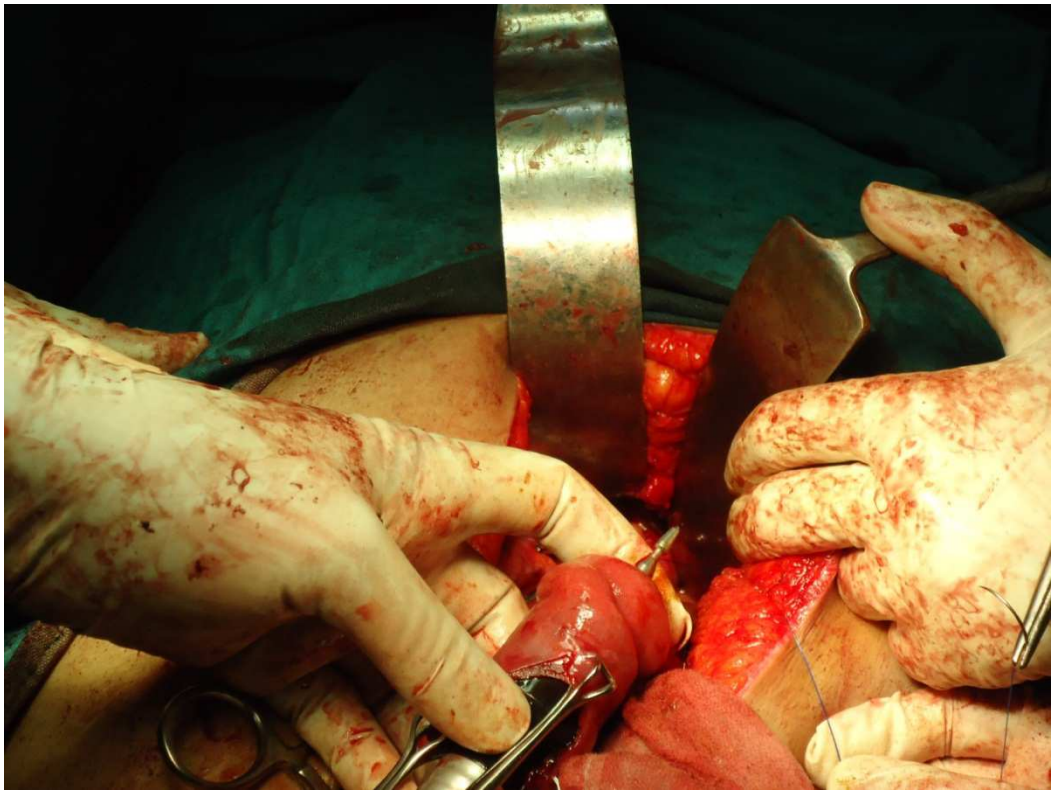
This type of circular staplers has various diameter;

- ❖ curved- from 21mm to 33mm
- ❖ straight- from 33mm to 36mm

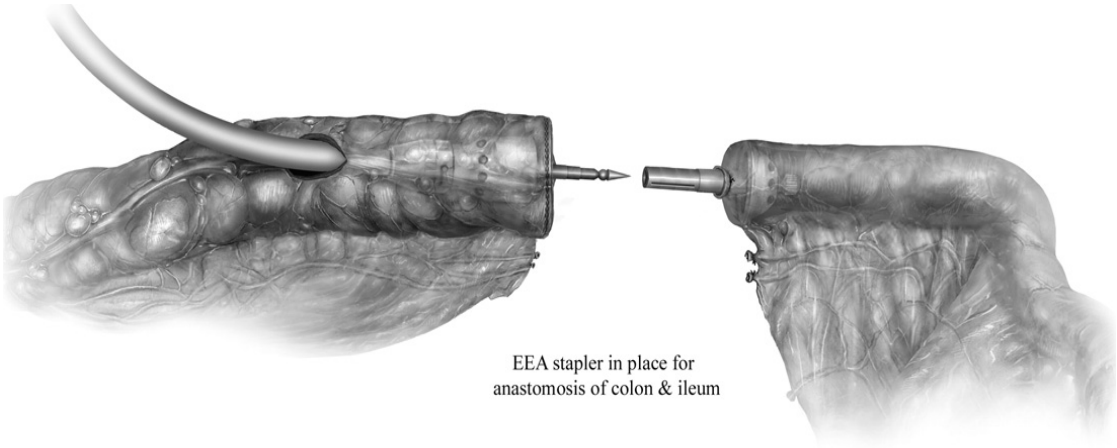
The stapler has titanium staples with in circular staggered arranged of two concentric rings inside the staples containing cartridge, the circular staples cuts automatically any tissue during release and create circular anastomosis.

The circular staplers can be easily operated by a complete squeeze in a trigger handle.dimension of circular anastomosis depends selected circular stapler containing cartridges.

Compact construction and modern design concordant with modern standards that ensure patient's and user's safety.



This straight circular stapler about 30mm of size used in our study case ,a case of carcinoma stomach following total gastrectomy for oesophago-jejunalanastomosis



DISPOSABLE LINEAR STAPLER

This types of staplers used mainly in gynaecological, paediatric, thoracic,abdomoinalsurgery's these are mainly available variable sizes ranges from 30 to 90 mm(this is the effective length of anastomosis)

Twostaples' heights are available for each size of the stapler, which through the control pressure facilitate anastomosing of thick tissues.

The linear stapler is containing of two staggered rows of titanium staples. The stapler can be easily operated by the complete squeeze of the trigger handle. The effective length of anastomosis is defined by the size of selected stapler.

Appropriate cartridges that can be used with linear staplers ensure cost-effective, single patient use of the product.

DISPOSABLE LINEAR CUTTING STAPLER

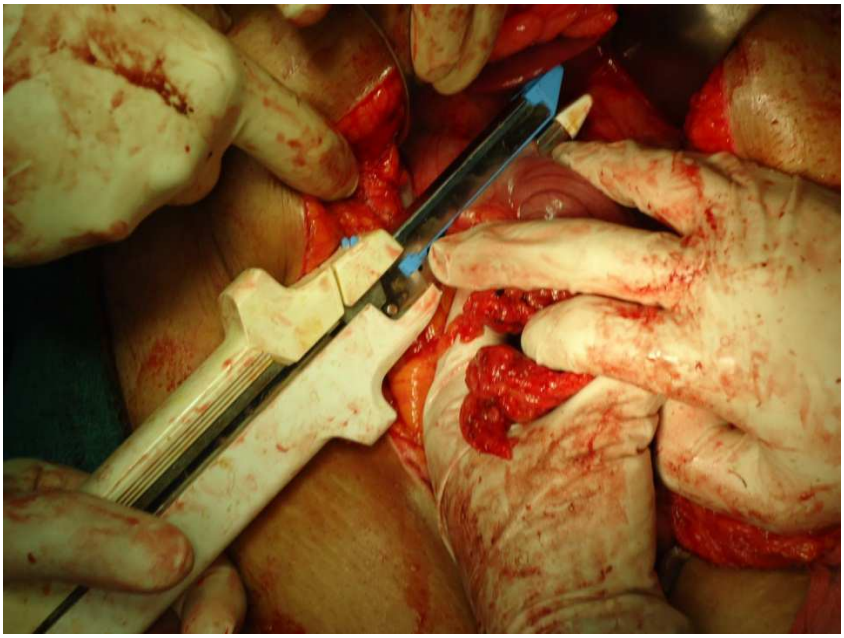
This types linear cutting staplers widely used in abdominal surgery, thoracic ,gynachological,paediatric,surgeries.

Mainly this types of staplers used in resection and transaction of organs and tissues.

This types of staplers available in sizes of 50 to 100mm ranging(effective length of anastomosis and resection of bowel loops).

Two stapls height are available of each size stapler which facilitateanastomosis and resection of both thick and thin tissues. The linear cutting stapler is loaded with two double staggered rows of titanium staples and simultaneously cuts and divides tissue between the two double rows. Sharp knife is built into the stapler body.

The stapler can be easily operated by complete squeeze of the handles followed by shifting of side knob forth and back. Built-in cam, distance pin and precise closing mechanism co-work to facilitate parallel jaws closing followed by proper staples formation. The effective length of anastomosis and transection is defined by the size of selected stapler.



This linear cutting stapler used in our study case about size off 65mm A case of periampullary carcinomafollowing whipples used in gastro-jejenostomy.

FACTORS FAVOUR FOR GOOD ANASTOMOSIS

- To determine adequacy of the blood supply, note the color of bowel ends and the presence of pulsatile flow in terminal arterial branches at bowel ends.
- Free up the bowel ends to ensure sufficient mobility to achieve a tension-free anastomosis.
- Accurate apposition of the layers of bowel is critical: submucosa to submucosa and seromuscular to seromuscular layers.
- There should be no fat, other tissues, or hematoma within the anastomosis. This can be a barrier to healing, and can increase the risk of leak.
- Clear no more than a 1-cm wide area of serosa for anastomosis to avoid devitalization.
- Avoid excessive force or tension when suturing the anastomosis to prevent strangulation and leak. Allow for some amount of postoperative edema.
- Avoid excessive manipulation of the bowel ends with forceps to prevent further injury and bruising

FACTORS FAVOUR FOR SUCCESSFUL ANASTOMOSIS

- Well-nourished patient with no systemic illness
- No fecal contamination, either within the gut or in the surrounding peritoneal cavity
- Adequate exposure and access
- Well-vascularized tissues
- Absence of tension at the anastomosis
- Meticulous technique
- Suture material favour for good anastamotichealin

FACTOURS UNFAVOUR FOR ANASTOMOSIS

- Sepsis
- Type and location of the anastomosis,eg; oesopheal and low anterior rectal anastomosis has the poor healing capacity
- Poor nutritional status like hypo albuminemia
- Doubtful viability
- Faccal contamination with peritonitis
- Associated with systemic illness like; anemia,malnutrition,previous irradiation or chemotheraphy,vitamin deficiency has poor healing capacity
- Disseminated malignancy(multiple peritoneal serosal deposits,ascitis)
- An unhealthy bowel condition precludes bowel anastomosis

CONTROVERISIAL ISSUES OF INTESTINAL ANASTOMOSIS

- Abdominal drains
- Naso gastric decompression;
- Inversion versus eversion of intestinal anastomosis

COMPLICATION OF INTESTIONAL ANASTOMOSIS

- Anastamotic leak
- Bleeding
- Anastamotis stricture
- Wound infection
- Prolonged functional ileus

ANASTAMOTIC LEAK

Is the single most important complication in the intestinal anastomosis.Anastamotic leak in upto 3rd postoperative period; inflammatory phase;this is mainly depends mechanical strength provided by the sutures.

Anastomotic leak presenting on postoperative day 1 or 2 is invariably due to technical reasons. Anastomotic leak secondary to interference in the normal healing mechanism usually presents around the end of the first postoperative week.

Anastamotic leak upto 7thpost operative day; fibroplasia phase,postoperative days 5-7, characterized by a switch from collagen degradation to collagen deposition that gives strength to anastomosis.

Any systemic or local factor that causes delay in the transition from the inflammatory phase to the fibroplasia phase can result in poor healing and anastomotic leak.

Systemic conditions that increase the risk of anastomotic leak are anemia, diabetes mellitus, malnutrition with hypoalbuminemia, vitamin deficiencies, and steroid therapy.

Local factors such as the presence of irradiated bowel, anastomosis involving disease-affected bowel, and inadequate blood flow are associated with poor healing and anastomotic leak.

Leak with diffuse peritonitis is associated with high morbidity and mortality and requires emergency laparotomy. During relaparotomy, a thorough lavage of the peritoneal cavity should carried out. In most of the times, it is better to dismantle the anastomosis and bring the bowel loops as stoma.

A controlled leak presenting with a localized intra-abdominal abscess can be managed conservatively with percutaneous drainage of the abscess under imaging guidance and antibiotics.

BLEEDING

Bleeding following intestinal anastomosis are common in patients with sepsis and deranged coagulopathy. It occur in immediate postoperative period manifest as a hemorrhagic aspirate from the nasogastric tube, hematemesis, melena, or bleeding from an intra-abdominal drain.

Patients with bleeding should be immediatelymanaged with correction of coagulopathy (if present) and blood transfusion.

Intraoperative anastomotic site bleeding is characterized by blood in the intestinal lumen distal to the anastomosis. In this circumstances, the anterior layer of the sutures is opened and both layers are examined for evidence of any bleeding.

Once the bleeding site is identified, it can be controlled by hemostatic sutures. The decision to reanastomose or convert into stoma depends upon the general condition of the patient. Conversion to stoma is preferred in patients with hemodynamic instability.

ANASTAMOTIC STICTURE

Anastomotic stricture is one of the late complication of intestinal anastomosis. The risk of anastomotic stricture is increased after end-to-end anastomosis, especially when performed in the stapled technique.

The most important risk factor for anastomotic stricture is a controlled anastomotic leak managed conservatively.

This is more common in the cervical esophageal and colorectal anastomotic leak. Anastomotic strictures occurring in these areas can be conservatively managed with endoscopic or colonoscopic dilatation. If this fails, surgical revision might be required.

WOUND INFECTION

Wound infection occurs when there is uncontrolled spillage of intestinal contents during anastomosis. It is managed by removing a few skin sutures and ensuring proper drainage of pus. Superficial surgical site wound infection does not require treatment with systemic antibiotics.

OPERATIVE TECHNIQUES OF SELECTED ANASTOMOSIS

- Preoperative precautions

Preoperative nasogastric aspiration is usually required. urinary catheterization is also necessary in critically ill patients, during emergency resections is used in monitoring of input output both perioperative and post operativeperiod.andinfraumbilical incision is used to protect the urinary bladder from injury during laparotomy.

An exploratory laparotomy may be performed. If the disorder is diagnosed preoperatively, the pathology can be identified and which part of the intestine to be resected is isolated and excised. And which part of Continuity is restored by performing the anastomosis.

Sometimes the resection and anastomosis of the bowel could be a part of another major surgical procedure, such as a Whipple procedure, gastrectomy, urinary diversions, or for a retroperitoneal tumor.

- Patient postioning , incisionand exposure;

  Patient postioning is very important because has helps surgeons to complete the operation successfully,and it must positioned planned operation.

  In the pelvic operaton care should be in legs , first patint positioned in the lithotomy position ,for adequate exposure of both abdomen and anus. In this positon legs should have excessive flexion and abduction, it prevent many post operative complication

  In case of oesophageal operation position should be in the left lateral position for thoracotomy

Adequate access is the key to ensuring successful intestinal anastomosis.A midline incision is commonly used for the majority of abdominal operations.

The use of self-retaining retractors ensures adequate exposure. Exposure in pelvic operations can be improved by changing the position of patient (Trendelenburg position) to displace small-bowel loops away from the pelvis

Packing the small bowel using wet sponges also improves exposure in pelvic procedures.

A supraumbilical transverse incision is frequently used in younger children.

BOWEL RESECTION

Mobilization is rare problem with the small bowel, can be easily brought to the surface.The large bowel (mainly the retroperitoneal segments) should be adequately mobilized by dividing lateral peritoneal fold. Bowel mobilization, in addition to facilitating resection, ensures tension-free anastomosis.

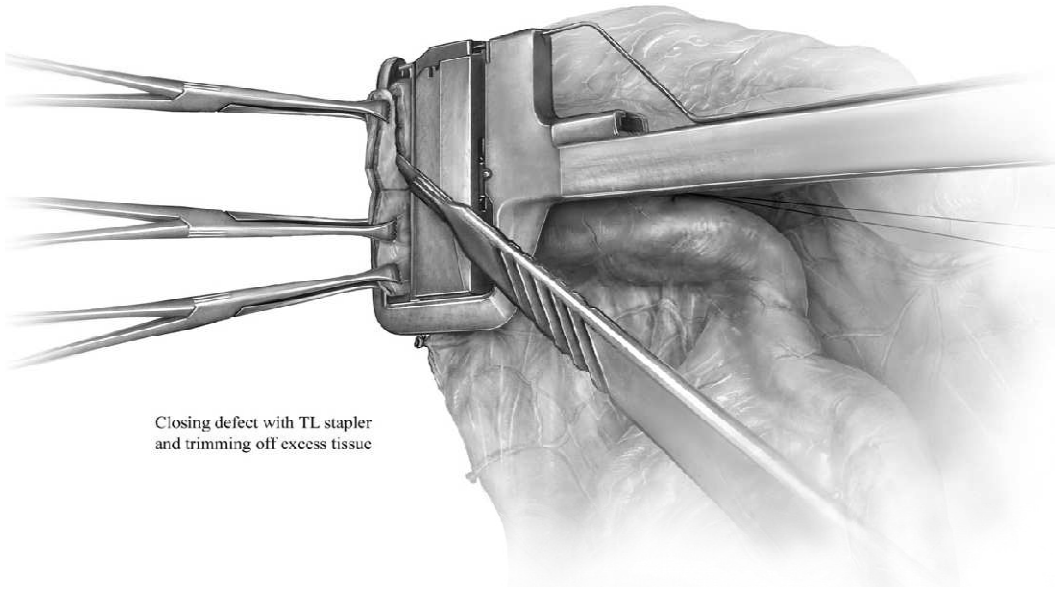
After mobilization of the bowel, the next step is the division of mesentery. Principles to be followed in division of mesentery include the following:

- To identify mesenteric blood vessels(translumination)
- Vessels should be isolated by dividing surrounding fat
- Division between clamp
- Ligating with suitable sutures to prevent knot slippage

Transfixation of vascular pedicles by nonabsorbable sutures is a safer method. Bleeding or hematoma formation within the mesentery should be avoided and preservation of vascular arcade to the bowel ends should be ensured so as to have satisfactory vascularity of the anastomosed bowel.

Division of the bowel; applying a noncrushing clamp on the bowel end used for anastomosis and crushing clamps on the bowel to be resected so that the intraluminal contents of the resected bowel not contaminate the peritoneal cavity. Clamps are applied in theantimesenteric end and care should be taken to avoid crushing of the mesentery.

The bowel is divided using a 11 size blade close to the crushing clamp to preserve adequate bowel length distal to a noncrushing clamp for anastomosis. The direction of division is oblique to ensure adequate lumen and maintain a longer length of the mesenteric end compared to the antimesenteric end.

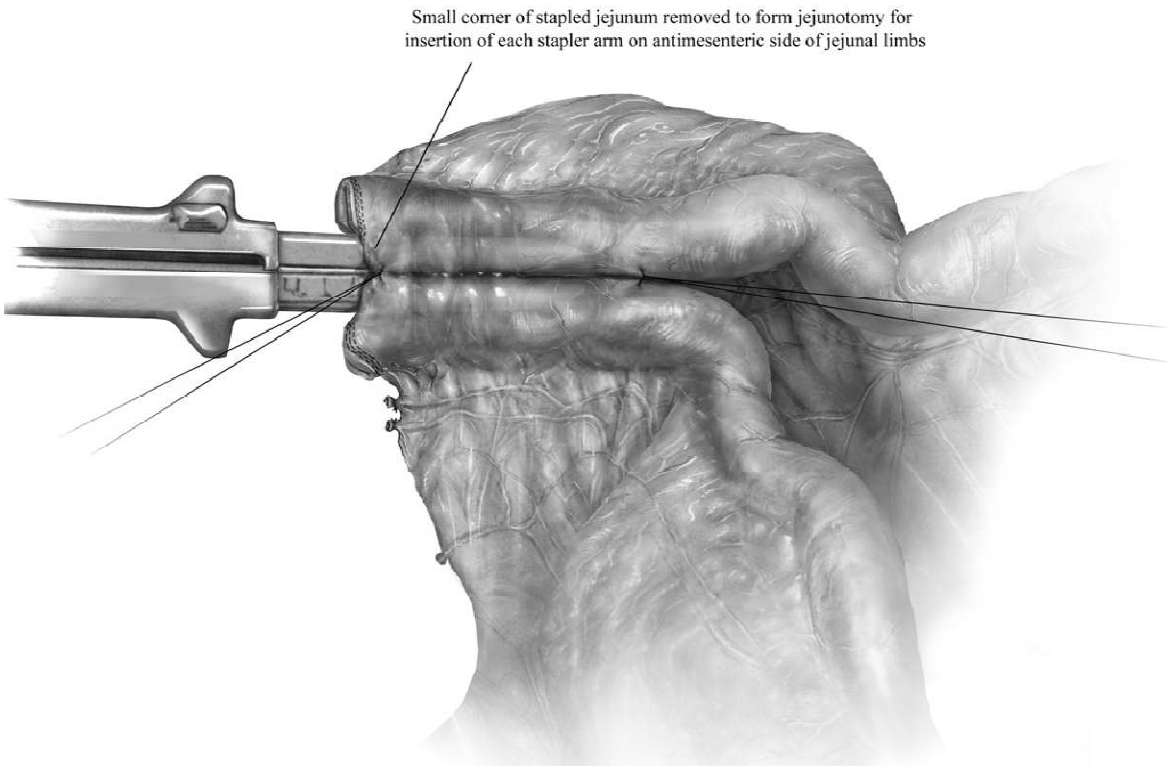


Care should be taken to avoid spillage of enteric contents during bowel division. Alternatively, bowel division can also done using a linear cutting stapler (gastrointestinal anastomosis stapler), which divides and seals two cut ends simultaneously, thereby preventing fecal contamination

STAPLER VERSUS HAND SEWN ANASTOMOSIS

Primary intention is main mode of healing process in the stapler anastomosis, but in case secondary intention of healing in the hand sewn anastomosis.

Titanium stapler will produced minimal tissue inflammatory reaction, so it produced more strength to the weakest phase of the healing process



Eversion is the major disadvandage in the stapler anastomosis initially but recent increased trend of mechanical devices that produced greater support and increased blood supply to anastamotic site it will overcome the eversion. In hand sewn also having this problem of eversion initially,it also overcome of this problem by advanced technique

STUDY MATERIALS AND METHODS

This study was conducted in the department of surgery & department of gastro enterology at GovtStanley medical college, started from December 2011 to November 2012 between the groups of hand sewn and stapler anastomosis in elective gastro intestinal surgeries.

- Control group- hand sewn anastomosis
- Study group-stapler anastomosis

This study included 100 patients; 56 of them underwent hand sewn anastomosis.its consists of 37 male patients, 19 female patient(mean age group 51 years). 44 of them underwent stapler technique. Out of 44 patient 27 male patient,17female patient(mean age group 49 years).

Hand sewn anastomosis done by single layer or double layer is under control group,but the study group has stapler anastomosis. Which was done by side to side or end to end anastomoses,it depends upon accessibility, the need of surgery, anastomotic site, using which type of stapler instruments

All profoma will be made that include detailed history,physical examination basic investigations and other relevant investigations required

All of them have been diagnosed,treated and followed up in the same hospital.All the patients had good nutritional reserve and had good bowel preparation and prophylactic antibiotics were given preoperatively

All patients were carefully monitored with the following parameters:

- Operating time,
- Return of bowel sounds
- oral feeding starting day,
- Hospital stay,
- Anastamotic complication like leak
- Return to work and mortality.

The following statistical test was used to compare the results of control group and study group:

- The patients were randomly allotted to control or study group.
- Independent samples T-Test to compare mean values betweenMethods.
- And also used to compare the mean value of the two methods
- Chi-square tests used to compare proportion of the two value

The observation will be analysed statistically and concluded

OBSERVATIONS AND RESULTS

The mean age of this procedure 52 in hand sewn ,50 in stapler total number of patient was19 where 10 underwent hand sewn anastomosis,9 underwent stapler anastomosis.

TOTAL GASTRECTOMY ANDOESOPHAO-JEJENOSTOMY GROUP:

	Method	**N**	**Mean**	**Std. Deviation**	**P-Value**
DURATION OF PROCEDURE	HAND SEWN	10	2.400	0.5164	0.289
	STABLER	9	2.167	0.5000	
RETURN OF BOWEL SOUND	HAND SEWN	10	2.80	0.789	0.078
	STABLER	9	2.22	0.441	
FEEDING	HAND SEWN	10	3.20	0.789	0.064
	STABLER	9	2.56	0.527	
HOSPITALIZATION	HAND SEWN	10	8.10	0.994	0.004
	STABLER	9	6.44	1.014	
RETURN TO WORK	HAND SEWN	10	5.60	0.843	0.002
	STABLER	9	4.22	0.441	

In my study the average time of operation in hand sewn anastomoses is 2.400 hrs but in case stapler anastomoses it was 2.167 hrs .the return of bowel sound is 2.80 days in suture anastomosis, it was 2.22 in mechanical devices. The mean time of starting oral feeding is 3.20 days in hand sewn anastomoses but in case of stapler anastomoses it was 2.56 days .hospitalization is 8.10 days in hand sewn anastomoses, but it was 6.44 days stapler anastomoses. Average return to work in hand sewn technique is 5.60 month in contrast 4.22 month in stapler technique the p value of this 0..002

SUBTOTAL GASTRECTOMY& GASTROJEJUNOSTOMY GROUP:

About 15 patient got this procedure .7 patient underwent hand sewn anastomosis,8 underwent stapler method.

In our study the average time to operation is 2.14 hrs in hand sewn anastomoses,it was 1.938 hrs in stapler anastomoses. The p value 0.012.The bowel sound occur in the 2.86 days of operative period in hand sewn anastomoses,it was 2.13 days of post operative period. P value 0.006. the oral feeding 3.14 days in hand sewn method but in stapler technique it was 2.25 days. P value 0.004.

The average hospitalization is 110.14 days in hand sewn technique,in stapler it was 8.00 days.p value-0.001.the return to work is 5.61 month in hand sewn method ,in stapler it was 4.13 month P-value 0.003

	Method	N	Mean	Std. Deviation	P-Value
DURATION OF PROCEDURE	HAND SEWN	7	2.714	0.3934	0.012
	STABLER	8	1.938	0.5630	
RETURN OF BOWEL SOUND	HAND SEWN	7	2.86	0.378	0.006
	STABLER	8	2.13	0.354	
FEEDING	HAND SEWN	7	3.14	0.378	0.004
	STABLER	8	2.25	0.463	
HOSPITALIZATION	HAND SEWN	7	10.14	0.690	0.001
	STABLER	8	8.00	0.756	
RETURN TO WORK	HAND SEWN	6	5.67	0.516	0.003
	STABLER	8	4.13	0.641	

RT HEMICOLECTOMY:

	Method	N	Mean	Std. Deviation	P-Value
DURATION OF PROCEDURE	HAND SEWN	6	3.000	0.6325	0.018
	STABLER	4	2.000	0.0000	
RETURN OF BOWEL SOUND	HAND SEWN	6	3.17	0.983	0.132
	STABLER	4	2.25	0.500	
FEEDING	HAND SEWN	6	4.00	0.632	0.014
	STABLER	4	2.50	0.577	
HOSPITALIZATION	HAND SEWN	6	10.17	1.602	0.020
	STABLER	4	8.00	0.816	
RETURN TO WORK	HAND SEWN	5	4.60	2.608	0.161
	STABLER	4	4.25	0.500	

About 10 patient underwent rthemicolectomy out of them 6 were got hand sewn anastomosisand 4 got stapler method.

In our study operating time of hemicoletomy is 3.00 hrs in hand sewn anastomoses,in case stapler it was 2.00 hrs in stapler technique, p value 0.018.

In return of bowel sound is 3.17 days in hand sewn technique but it was 2.25 days in stapler anastomoses.oral feeding mean time to start in hand sewn anastomoses is 4.00 days but it was 2.5. days in stapler technique. The p value 0.014.

Regarding hospitalization the average days in hand sewn anastomoses is 10.17 days but it was 8.00 days in stapler anastomoses the p value 0.020. the return of work in hand sewn anastomoses is 4.60 month but it was 4.25 instapler technique. P value 0.161.

LOW ANTERIOR RESECTION :

	Method	N	Mean	Std. Deviation	P-Value
DURATION OF PROCEDURE	HAND SEWN	12	2.542	0.5418	0.021
	STABLER	6	1.917	0.2041	
RETURN OF BOWEL SOUND	HAND SEWN	12	3.00	0.426	0.013
	STABLER	6	2.33	0.516	
FEEDING	HAND SEWN	12	3.33	0.651	0.264
	STABLER	6	3.00	1.095	
HOSPITALIZATION	HAND SEWN	12	8.67	0.778	0.008
	STABLER	6	7.50	0.548	
RETURN TO WORK	HAND SEWN	11	5.82	0.603	0.001
	STABLER	6	4.17	0.753	

In the low anterior resection group, about 18 patient underwentanastomosis.12 got suture method,6 got stapler method.

In our study the average time operation in hand sewn anastomoses is 2.542 hrs, in case of stapler anastomoses it was 1.917 hrs .p value 0.021 .the bowel return in hand sewn technique is 3.oo days, in contrast 2.33 days in stapled anastomoses. P value is 0.013 the oral fluids given time in hand sewn technique is 3.33 days but in case of stapler it was 3.00 days. P value 0.013.

The mean duration of hospital stay in hand sewn is 8.67 days but in case stapler it was 7.50 days. The p value 0.008 the average return to work is 5.82 month in hand sewn but it was 4.17 in stapled anastomoses p value 0.001.

WHIPPLES PROCEDURE:

	Method	N	Mean	Std. Deviation	P-Value
DURATION OF PROCEDURE	HAND SEWN	7	4.929	0.3450	0.001
	STABLER	10	3.300	0.4830	
RETURN OF BOWEL SOUND	HAND SEWN	7	4.00	0.577	0.003
	STABLER	10	2.70	0.675	
FEEDING	HAND SEWN	7	4.29	0.951	0.032
	STABLER	10	3.20	0.919	
HOSPITALIZATION	HAND SEWN	7	12.71	0.756	0.001
	STABLER	10	10.10	1.370	
RETURN TO WORK	HAND SEWN	7	6.43	0.787	0.002
	STABLER	10	5.00	0.816	

Whipples procedure group; seven patient underwent this procedure out of them 7 got hand sewn anastomosis,10 got stapler anastomosis.

This procedure having mean operating time 4.929hrs in suture method,but in stapler method it was 3.30hrs , mean return of bowel sound is 4.10days in hand sewn anastomosis,but in stapler anastomosis it was 2.70 days,mean oral feeding started in hand sewn anastomosis is 4.29 days but in stapler anastomosis it was 3.20 days,mean hospitalization is 12.71days in hand sewn anastomosis but in stapler it was 10.10days,mean return of work is 6.43 month in hand sewn anastomosis,but in stapler it was 5 month , there was 2 patient had anastomotic leak in whipplesprocedureanastomosis done by hand sewn out of them 3 patient was died following this complication

RESECTION AND ANASTOMOSIS GROUP:

	Method	N	Mean	Std. Deviation	P-Value
DURATION OF PROCEDURE	HAND SEWN	9	3.000	0.4330	0.040
	STABLER	6	2.250	0.7583	
RETURN OF BOWEL SOUND	HAND SEWN	9	3.00	0.707	0.170
	STABLER	6	2.50	0.548	
FEEDING	HAND SEWN	9	3.56	0.527	0.031
	STABLER	6	3.00	0.000	
HOSPITALIZATION	HAND SEWN	9	9.56	0.726	0.002
	STABLER	6	8.17	0.408	
RETURN TO WORK	HAND SEWN	9	5.11	0.601	0.007
	STABLER	6	3.83	0.753	

Resection anastomosis group about 15 patient we had out of them 9 were underwent hand sewn but 6 patient underwent stapler anastomosis.There was a mean operating time is 3hrs in hand sewn anastomosis,but in case stapler anastomosis it was 2.250hrs,mean return of bowel sound is 3days in hand sewn anastomosis,but in stapler anastomosis it was 2.50 daysmean feeding time of hand sewn anastomosis is 3.56 days ,in case of stapler anastomosis it was 3 days,mean hospitalization of hand sewn anastomosis is 9.50 days in case of stapler anastomosis it was 8.17days,mean days of return to work is 5.11 month in hand sewn anastomosis but in stapler anastomosis it is 3.83 month .in this group resection anastomosis 5 patient(out of 9 patient hand sewn anastomosis) have anastomotic leak , all complication spontaneously resolved, and there is no mortality.

ANASTOMOTIC LEAK

Within 100 patient about 22 patient had anastomotic complication,16 patient received hand sewn anastomosis,but 6 patient got stapler anastomosis, mortality 4 patient died their underwent hand sewn anastomosis, one patient died due to the stapler anastomosis.

		Method				**Total**		**P-Value**
		HAND SEWN		**STABLER**				
		N	**%**	**N**	**%**	**N**	**%**	
SEX	Male	37	57.8	27	42.2	64	100.0	0.626
	Female	19	52.8	17	47.2	36	100.0	
ANASTAMOTIC LEAK	Absent	40	51.3	38	48.7	78	100.0	0.074
	Present	16	72.7	6	27.3	22	100.0	
MORTALITY	No	52	54.7	43	45.3	95	100.0	0.381
	Yes	4	80.0	1	20.0	5	100.0	
Total		56	56.0	44	44.0	100	100.0	

In our sturdy two patient undergone trunkalvagotomy& drainage procedure for gastric outlet obstruction due to the benign disease .anastomosis done by hand sewn only so these not included in my datas.

Another two patient underwent ileostomy by suture method only following post ileostomy(for benign disease) these also not included in my study.

In our study i had two inoperable case

- Triple bypass surgery for carcinoma head of pancrease this patient had extensive metastasis, anastomosis done by stapler method, anastomosis healed well there was no complication regarding anastamotic site, but in my follow up the patient was died within 9 month.

- Another patient carcinoma stomach with extensive peritoneal deposits and extensive intra abdominal metastasis,underwent drainage procedure(gastro jejenostomy and jejeno-jejenostomy)anastomosis done by hand sewn ,we had one patient like this inoperable of carcinoma stomach .so these inoperable not able compare.

DISCUSSION

Surgical stapling were first introduced by Hültl, Humer in 1908; but their use has grown since the introduction of new disposable instruments in the past 35 years. However despite comparable results in terms of mortality, anastomotic leak, and duration of procedure, the rate of stricture at the anastomotic site is considerably higher with staples anastomosis than with sutures:

Lim et al identified the presence of foreign body reaction in stapled human GI anastomoses. The source of foreign materials eliciting this reaction was the stapler cartridges.

MATOS STUDY FOR COLORECTAL ANASTOMOSIS

Matos conducted many study,he systematically reviewed nine studies involving 1233 patients (622 stapled and 611 hand-sewn) and found that the leaks were 13% *vs* 13.4%, clinical it was 6.3% *vs* 7.1%, radiological it was 7.8% *vs* 7.2%. There was insufficient evidence to demonstrate superiority of either technique. The decision over which technique to use must be judged on the basis of previous experience, clinical, and available resources radiological. Another systematic review showed that both techniques (stapler *vs* Hand-sewn) are effective, and the choice may be based on personal method.

Other prospective and randomized trials got different results. No significance intergroup difference was found in regard to time for anastomosis construction or occurrence of complications in anastomosis.

In addition, the routine use of stapling instruments for infraperitoneal colorectal anastomosis could not be recommended because of a higher incidence of strictures, even though the operation having less time to perform and anastomotic leakage occurred less often.

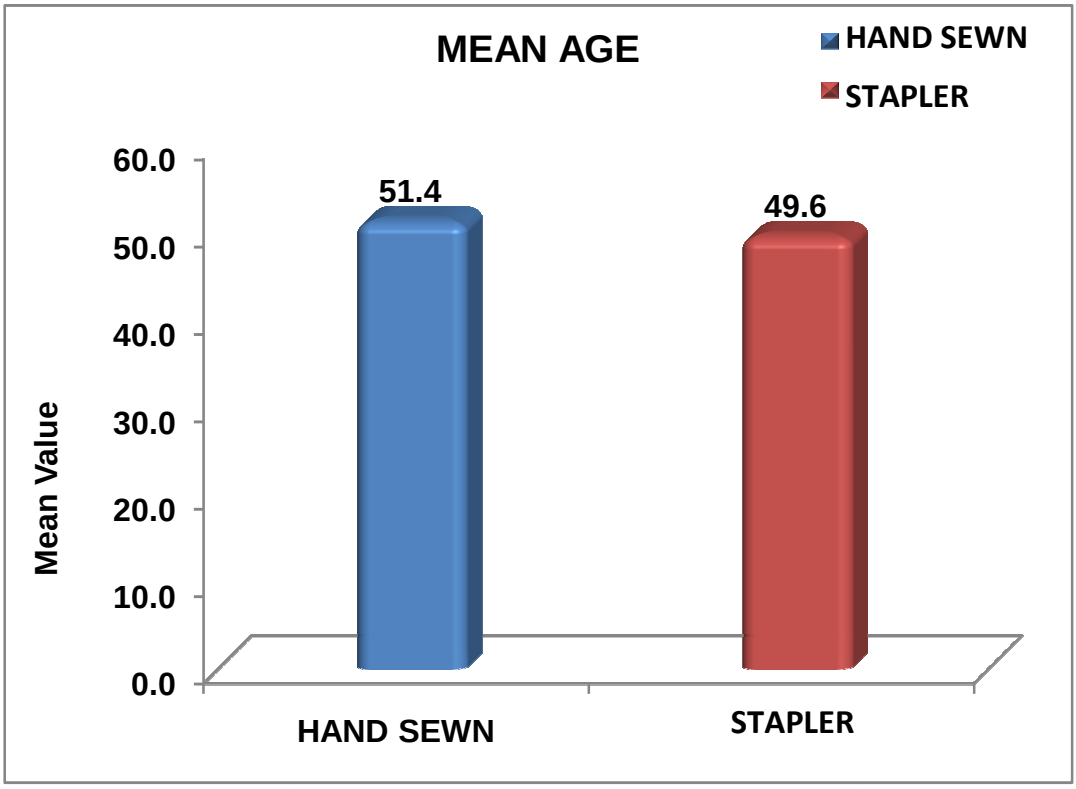
Therefore, it is an ongoing search , to find a ideal method of anastomosis that not only the incidence of dangerous complications, but

also avoid the need for complicating colostomy or ileostomy. Based on the this data, there is a controversy occur between the surgeons.

Therefore all the relevant datas and studyswanted to resolve this issue. Multi-center, well-designed, randomized controlled trials are required to build a link between stapling and hand sewn anastomosis. The use advanced techniques should allow improvements in the quality of patient treatment.

So I compare between my study and some other auther'sstudies as following variable of anastomosis:

AGE

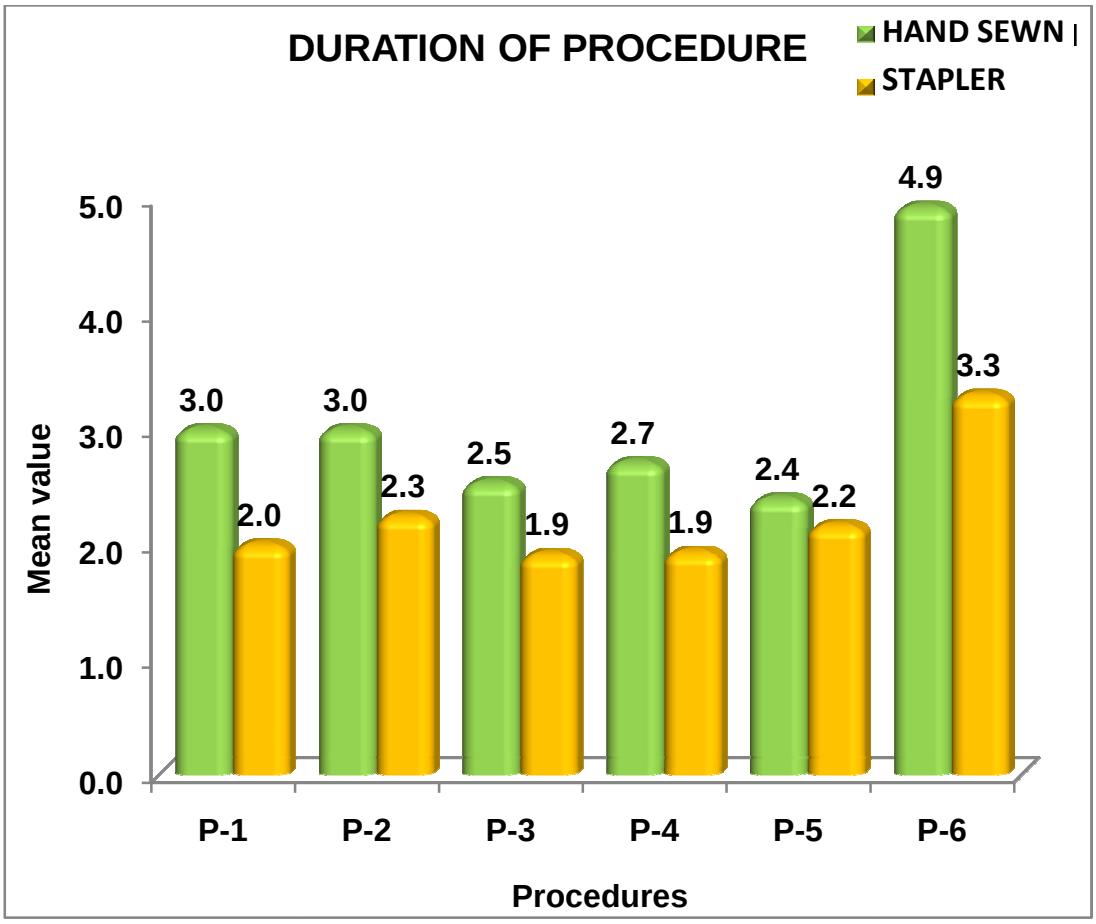


In this study the total 100 patient average of patient were underwent staple anastomosis is 49.6 years but in case but in case hand sewn anastomosis the age of the patient was 51.4 years

In the scher study the average of the patient was 58.6 years in stapler anastomosis ,in hand sewn anastomosis it was 54.6 years.

In reilingstudy stapleranastomosis patient having 56.8 years ,55.1 years having hand sewn anastomosis.

DURATION OF PROCEDURE



1. In my study the mean duration of time in total gastrectomy&oesophago-jejenostomy(procedure5) by hand sewn is 170 min,but in case stapler it was 130min ,there is a differences of 40 min between hand sewn vs stapler, the p value 0.289.

In total gastrectomygroup scher study shownoprating time 159.8 min in sutured anastomosis ,163 min in stapled technique. So there was no difference in his study in duration of operating time.

Reiling also got same results as for scherstudy , no difference in duration of operating time.

2. in my study mean duration of time sub totalgastrectomy&gastro-jejenostomy(procedure4) hand sewn anastomosis is 2.12 hrs but in case of stapler it was 2 hrs . the p value is 0.12scher study shown no difference of duration of procedurein sub totalgastrectomy . the results is 155.6 min in hand sewn anastomosis, 157 min in stapled anastomosis.in the reiling study also shown no difference.

3. In my study mean duration of time of rthemicolectomy (procedure1) is 3 hrs in hand sewn in contrast 2 hrs in stapler anastomosis. Its showing stastistically difference of p value 0.018

There is a diference presence in scher and reilingstudy of duration of operating procedure in rthemicolectomy patient.

4. In my study mean duration of time of low anterior resection(procedure2) is 2.542 hrs in hand sewn anastomosis,but in the stapler anastomosis it was 1.917 hrs . the p value of this is 0.021

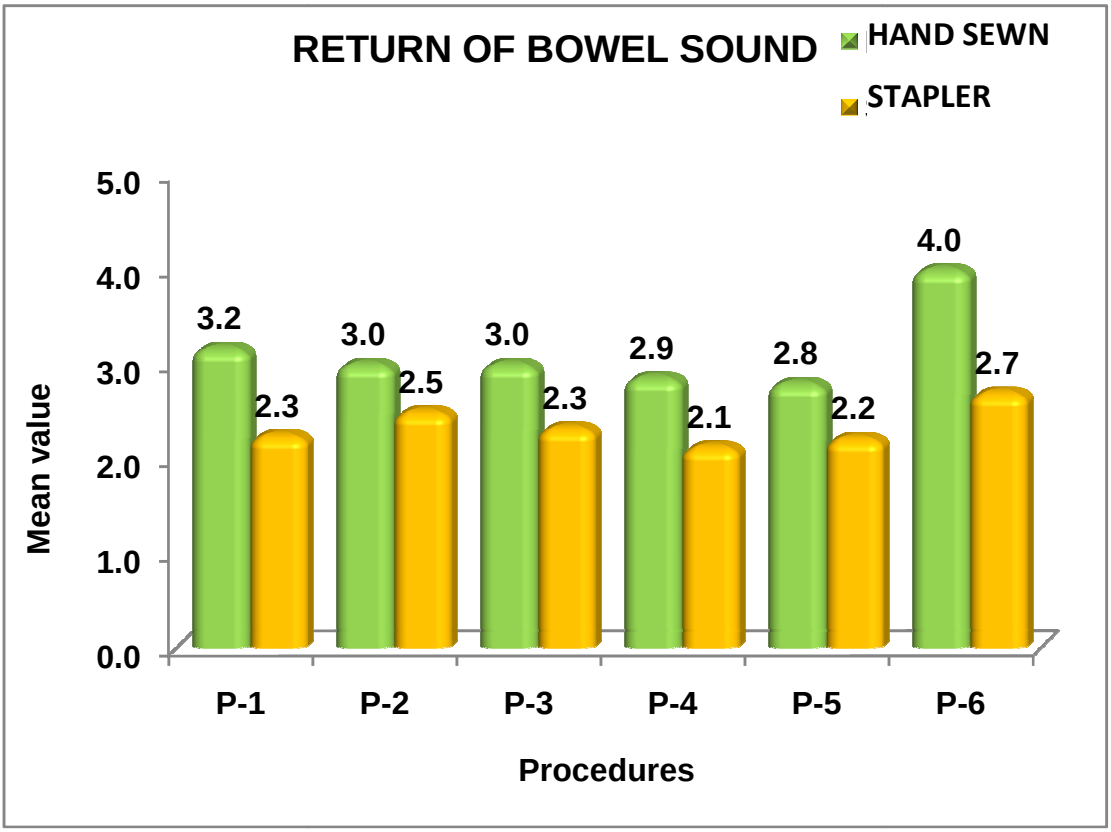
Adloff study shown there is differences present in between these technique of low anterior resection surgery. He got 176 min in sutured anastomosisand 180 min in hand sewn anastomosis.

Scher having 209 min in stapled technique,185.9 min in stapler anastomosis, he got mild longer time in stapled method.

5. In my study the mean duration of time inwhipples(procedure6) procedure is 4.929 hrs in hand sewn anastomosis but in stapler group 3.300 hrs .the p value is 0.001

6. In my study the mean duration of time in resection &anastomosis is 3 hrs in hand sewn anastomosis but in case stapler it was 2.250 hrs. the p value 0.040

RETURN OF BOWEL SOUND AND ORAL FEEDING

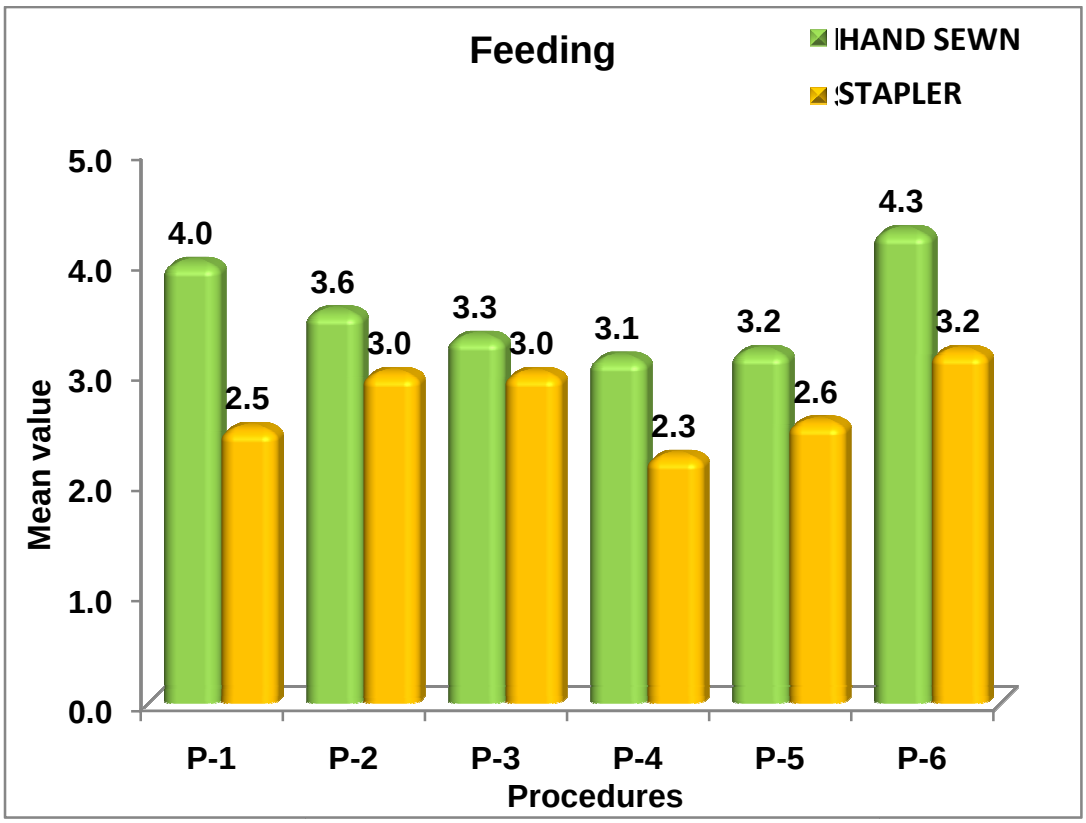


In my study mean time to appearance of bowel sound in total gastrectomy&oesophago-jejenostomy(procedure5) is 3 days in hand sewn anastomosis,but in case stapler it was 2 days. The p value 0.078.the mean time to start oral feeding in hand sewn anastomosis is 3.50 days, in stapler group it was 2.50 days. The p value is 0.064.

Scher study shown return of bowel sound and starting of oral feeding3.9 days in hand sewn ,in stapler it was 4.8 days .he shown

there is return of intestinal function better in sutured method than stapler method.

In reilingstudy shown no differences in return of bowel sound & oral feeding of both technique.



1. In my study mean time to return of bowel sound in sub totalgastrectomy& gastro-jejenostomy(procedure4) is 2.86 days in hand sewn group ,2.13 days in stapler anastomosis . the p value is 0.004.the mean duration of starting oral feeding is 3.14 days in hand suture method, but 2.25 days in stapler group.the value of this is 0.006)

In Sub totalgastrectomyscher study shown sutured technique is better than the stapler because he started oral feeding earlier in sutured method

2. In my study group rthemicolectomy(procedure1) patient having mean time to return of bowel sound is 3 days in hand anastomosis,in stapler group it was 2 days . p value of this o.132. mean time to take oral feeding 4 days in hand sewn group , in staler group it was 2.50 days. The p value 0.014

   Scher study shown there is no difference between both anastomosis in this parameter.hand sewn is 3.7 days ,stapler 3.8 days

3. In my study mean time of bowel sound heard is 3 days, In suture method ,it was 2.33 days in stapler method .the p value is 0.013 in the low anterior resection group(procedure3) of the patient.

   In the same group of patient mean days to start orat feeding is3.33 days in suture, 3.00 days in stapler technique. The p value of this 0.264

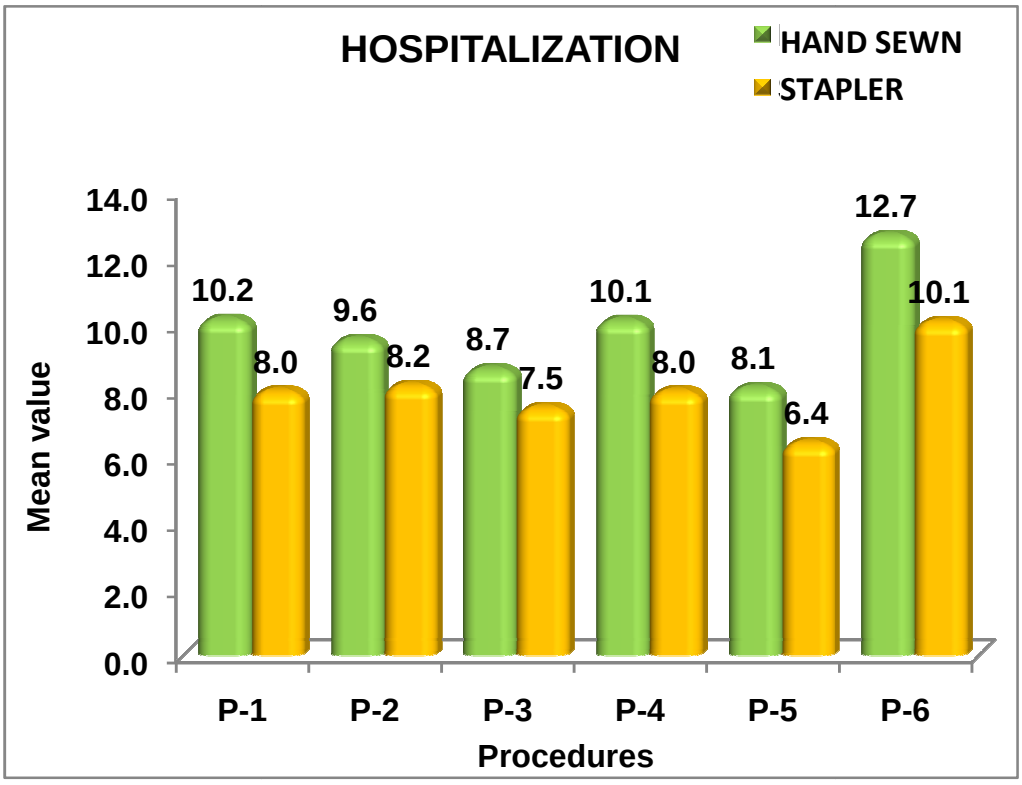
   Scher and adloff study shown no clinical difference between both technique in low anterior resection

4. In my study whipples(procedure6)group of patient having mean time return of bowel sound is 4 days in hand sewn method,2.70 days in stapler method.the p value is 0.003.

   The mean time to oral feeding is 4.29 in suture,3.20 days in mechanical devices.the p value 0.032.

5. In my study group of patient the resection anastomosis(procedure2) having mean time return of bowel sound is 3 days in hand sewn, but in stapler it was 2.50 days . p value 0.031

HOSPITILIZATION



1. In my study total gastrectomy(procedure 5) mean day of hospitalization is 8 days in suture method,but in case stapler it was 6 days . the p value 0.004

   Reiling and scherstudy having no difference between these both anastomosis technique

2. Mean day of hospitalization in sub totalgastrectomy (procedure4) was 10 days in hand sewn anastomosis, in contrast 8 days in stapler technique.p value 0.003

Reiling and scher detected there no significant differences in these two technique in their study.

3. In our study rthemicolectomy(procedure1)patient having mean hospitalization days 10.17 days in suture method,it was 8.10 days in stapled anastomosis.p value 0.020

   Reiling and scher study shown there is significant differences between these technique.

4. In low anterior resection(procedure3) mean day of hospitalization 8.07 days in suture anastomosis, but in case of stapler method it was 7.50 days.the p value 0.008

   Adloff study not detected any difference in hospitalization of both techniquesbut scher detected insignificant differences present between these method.

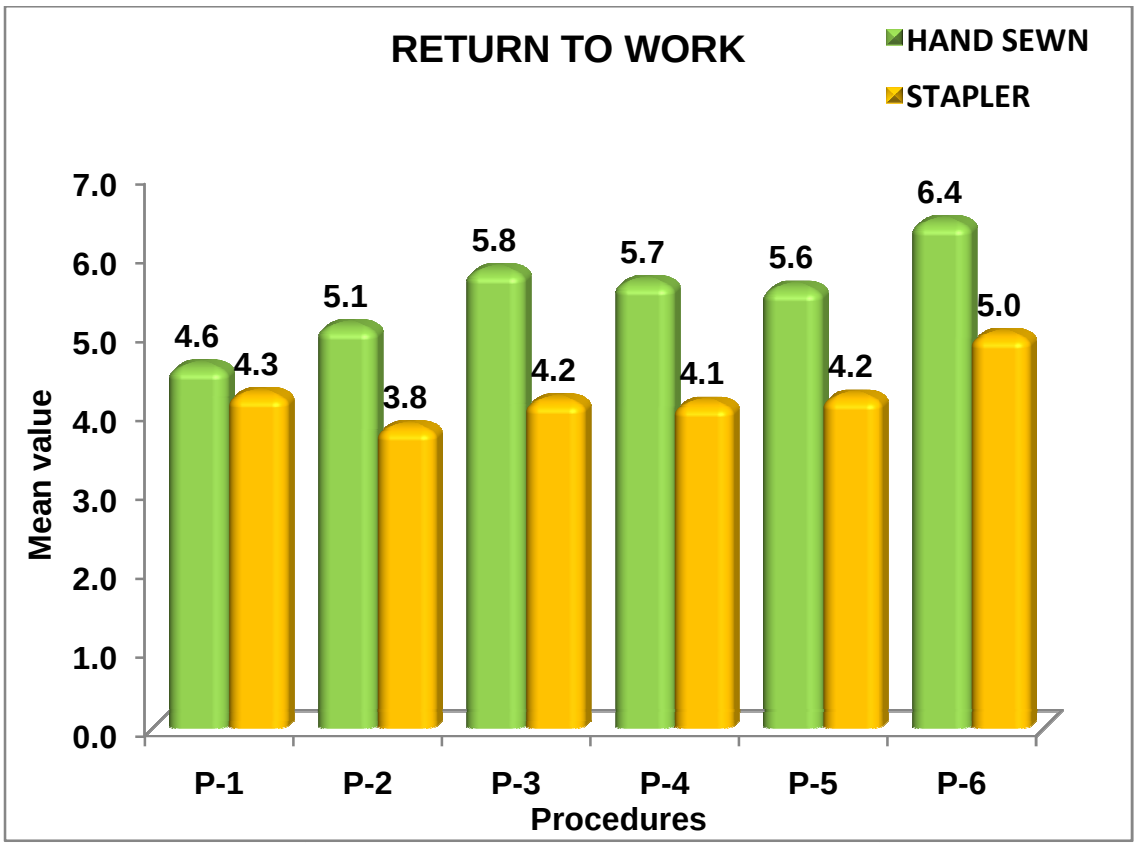
5. In my study mean day hospitalization is 12.71 days in hand sewn technique,in stapler it was 10.10 days whipples (procedure6).p value 0.001.

6. In resection &anastomosis(procedure2) mean duration of hospitalization 9.50 days,but it was 8.17 days in stapled method.the p value is 0.002

RETURN TO WORK

1. In my study mean duration of return to normal work in the group of total gastrectomy(procedure5) is 5.60 month followed hand sewn anastomosis but in case stapler it was 4 .22month. The p value 0.002

   There is study found compare in this parameter.



2. In case subtotal gastrectomy&gastro-jejenostomy(procdure4) mean duration return to work is 5.67 month suture method,but it was 4.13 month in stapler method. The p value 0.003

No study was found which observed this parameter

3. In this study rthemicolectomy(procedure1)group of patient having mean duration of return to work is 4.60 month in suture method,in stapler method it was 4.25 month . p value 0.161

   No other study was found observed in this parameter

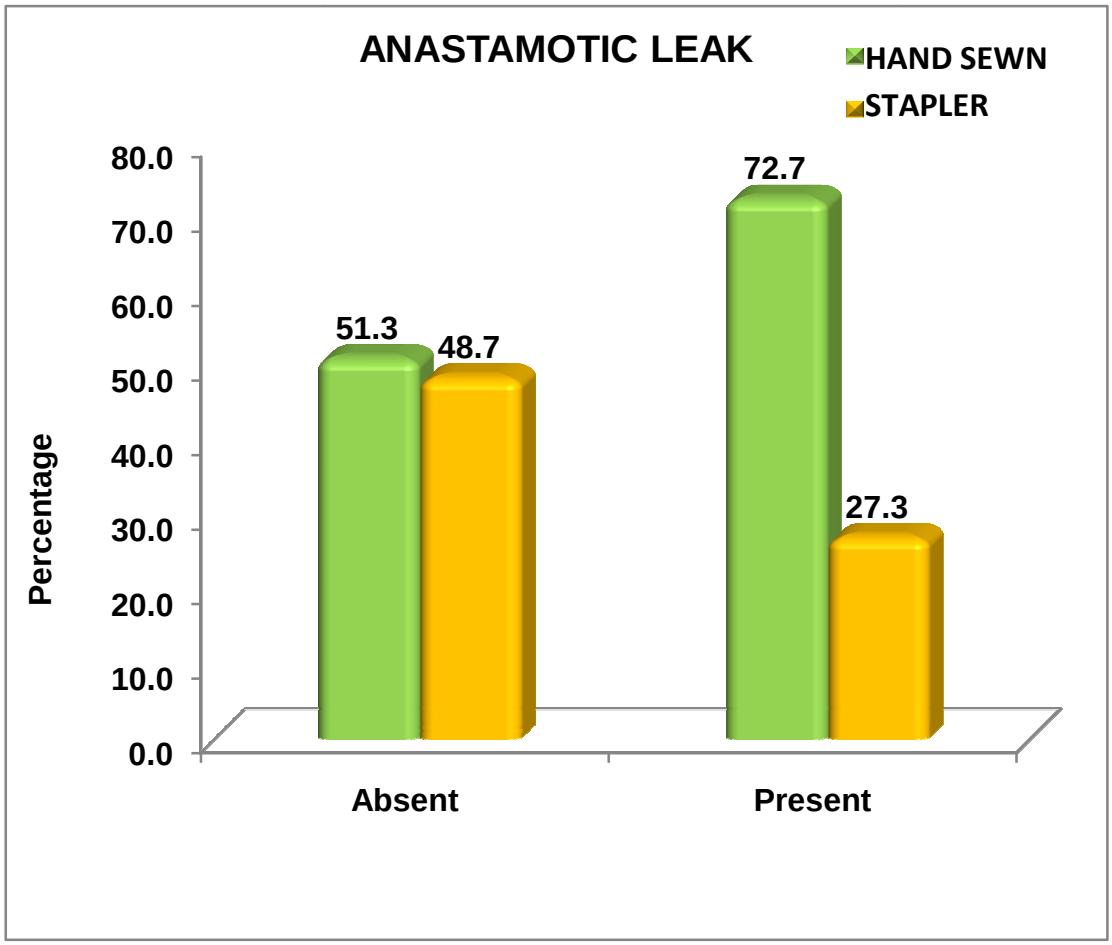
4. In the group low anterior resection group(procedure3) patient having mean duration of return to work is5.82 month hand sewn method,it was 4.12 month in stapled group of patient.p value 0.001.

   This group also not having study to compare this parameter

5. In the whipples group(procedure6) hand sewn anastomosis having 6.43 month mean duration of return to work,but in stapled method having 5.00 month mean duration of return to work.p value 0.002

6. In my study resection anastomosis (procedure2) suture technique having mean duration of return to work is 5.11 month, but it was 3.83 month in stapler anastomosis technique.the p value 0.007

In our study, anastomotic leak complications occurred in 16 patient out of that of the 56 patient(72.7%) with suture technique and in 6 out of 44 patients (27.3) with stapler anastomosis p value 0.074. In these group of patient about 17 patient leak spontaneously recovered in both hand sewn and stapler anastomosis. Another 5 patient was died due this complication .within 5 patient four were undergone (80%) hand sewn anastomosis,one patient stapler anastomosis. P value 0.381

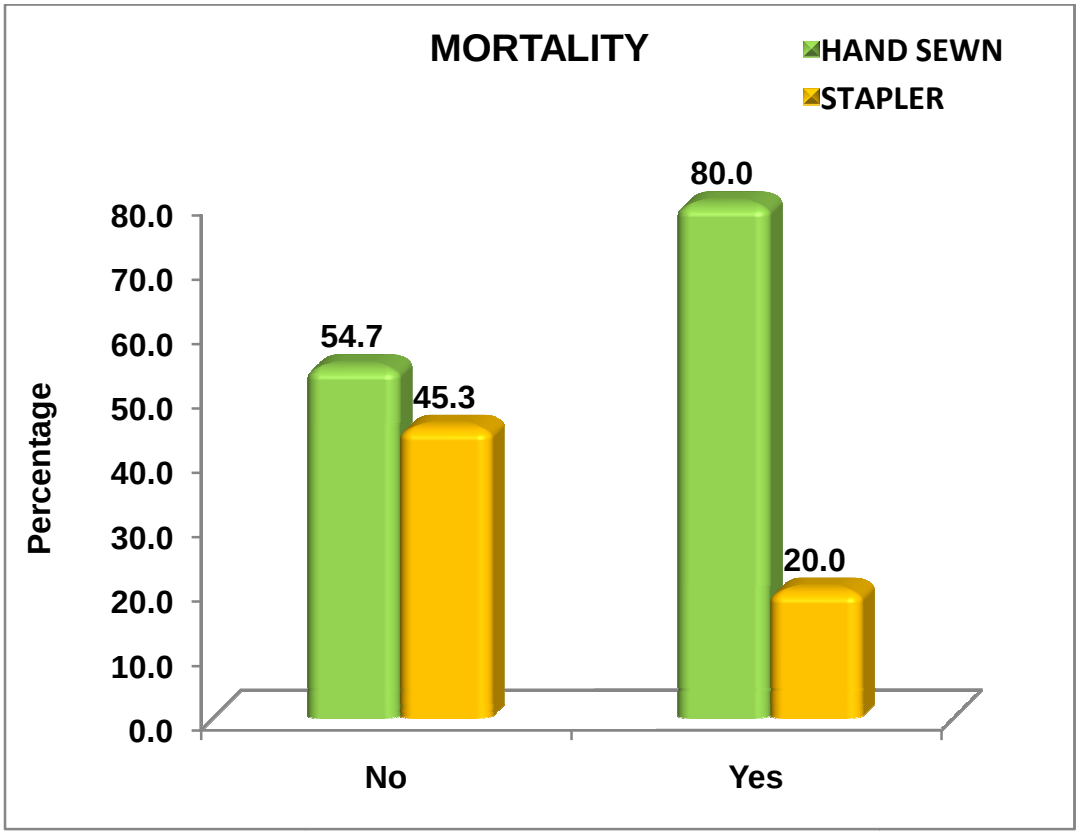


In the scher (series 3) study about one patient had complication like anastomotic leak out of 36 patient who underwent stapled anastomosis in gastric resection patients , so got anastomotic leak rate 2.7%.

In scher study shown 2.9% patient having anastomotic leak in stapled anastomosis, but it was 2.1% in sutured anastomosis .so he observed there is no significant difference in both techniques regarding anastomotic leak complication.

Reiling and adloff also concluded there is no significant differences of complication in both techniques

MORTALITY



About 5 patient was died due this anastomotic complication. within 5 patient four were undergone (80%) hand sewn anastomosis, one patient stapler anastomosis. P value 0.381.

SUMMARY AND CONCLUSION

Comparison study of hand sewn versus stapler was conducted previously had not shown any different between these two anastomotic technique.

In my study i found a significant difference in reduction of time duration of surgical procedure using well trained surgeons in both type ofanastomotic technique

Seven variability compare the six group gastro intestinal surgeries.The variability are following

- Duration of procedure
- Return of bowel sound
- Oral feeding
- Return to work
- Hospitalization
- Complication
- Mortality

So after conducting in my study the following results showing stapler anastomoses is superior to the hand sewn anastomoses

- Less tissue injury
- Less operating time
- Early recovery of bowel sound
- Oral feeding started as early as possible
- Early mobilization from the bed
- Decreased hospitalization
- Early return to normal day to day activity

Recent advanced mechanical are more costly than the suture materials, cost benefit not included in my study because the study done in govt hospital.

The stapling techniques are quicker to perform, particularly in situations where inaccessibleeg pelvic surgeries like low colorectal anastomosis or in various oesophageal anastomosis.

Thus, the staplinganastomosis can be used safely and effectively as part of the surgical department and one should be equally adept with a stapler gun as with needle-holder and suture.

வயிறு மற்றும் குடல் அறுவை சிகிச்சைகளில் ஸ்டாப்ளர் மூலம் செய்யப்படும் குடல் இணைப்பு,கையால் செய்யப்படும் இணைப்பு-இவ்விரண்டின் ஒப்புமை ஆய்வு நிலை.

ஆய்வாளர்: டாக்டர்.சா.சதாசிவம். முதுநிலை பட்டமேற்படிப்பு மாணவர், அறுவை சிகிச்சை பட்டபடிப்பு.

வழிகாட்டி: பேராசிரியர்.டாக்டர்.ஆர்.குமார்,அறுவை சிகிச்சை பேராசிரியர்,அரசு ஸ்டான்லி மருத்துவமனை.

பங்கேற்பாளரின் தகவல் படிவம் நீங்கள் இந்த ஆய்வில் பங்கேற்க அழைக்கப்படுகிறீர்கள். இந்த ஆய்வில் பங்கேற்கும் முன்னர்,இதன் நோக்கத்தையும் முறைகளையும் இதனால் ஏற்படக்கூடிய பின்விளைவுகள் ஏதேனையும் நீங்கள் அறிந்துக் கொள்ள ஆய்வாளர் அளிக்கும் ததகவல் பின்வருமாறு: வயிறு மற்றும் குடல் அறுவை சிகிச்சைக்கு உட்படுத்தப்பட இருக்கும் நோயாளிகள் மட்டுமே இந்த ஆய்வில் எடுத்துக் கொள்ளப்படுவீர்கள்.உங்கள் நோயின் முழு வரலாறும்,உங்களின் முழு உடல் பரிசோதனையும் தெளிவாகவும் விரிவாகவும் பதிவு செய்யப்படும்.அடிப்படை இரத்த பரிசோதனை மற்றும் நுண்கதிரியல் பரிசோதனைகளின் முடிவுகள் ஏற்றவாறுபதியப்படும்.அறுவை சிகிச்சைக்கு முன்னும்,பின்னும் மற்றும் அறுவை சிகிச்சையின் பொழுதும் உங்களிடம் ஏற்படும் உடல் நிலை மாற்றங்கள் பதிவு செய்யப்படும்.

இந்த ஆய்வின் முடிவுகள் மருத்துவ காரணங்களுக்காகவும் மருத்துவக் கல்விக்காகவும் பயன்படுத்தப்படும்.இந்த ஆய்வு பற்றிய சந்தேகங்களுக்கு உரிய முறையில் விளக்கமளிக்கப்படும்.தங்களைப் பற்றிய தகவல்கள் ரகசியமாகப் பாதுகாக்கப்படும். இந்த ஆய்விலிருந்து எப்பொழுது வேண்டுமானாலும் தாங்கள், எவ்வித முன்னறிவிப்பின்றியும், எவ்வித சட்டச் சிக்கலும் இன்றியும் விலகிக்கொள்ளலாம். இந்த ஆய்வில் பங்கேற்கமாறு கேட்டுக் கொள்கிறேன்.

நன்றி,

நோயாளியின் கையொப்பம் ஆய்வாளர் கையொப்பம்
(டாக்டர்.சா,சதாசிவம்)

வயிறு மற்றும் குடல் அறுவை சிகிச்சைகளில் ஸ்டாப்ளர் மூலம் செய்யப்படும் குடல் இணைப்பு ,கையால் செய்யப்படும் இணைப்பு-இவ்விரண்டின் ஒப்புமை ஆய்வு நிலை.

ஆய்வாளர்: டாக்டர்.சா.சதாசிவம். முதுநிலை பட்டமேற்படிப்பு மாணவர், அறுவை சிகிச்சை பட்டபடிப்பு.

வழிகாட்டி: பேராசிரியர்.டாக்டர்.ஆர்.குமார்,அறுவை சிகிச்சை பேராசிரியர்,அரசு ஸ்டான்லி மருத்துவமனை.

பெயர்: வயது: உள்ளிருப்பு எண்:

இந்த மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது.என்னுடைய சந்தேகங்களைக் கேட்கவும்,அதற்கான தகுந்த விளக்கங்களைப் பெறவும் வாய்ப்பளிக்கப்பட்டது. நான் இவ்வாய்வில் தன்னிச்சையாகத் தான் பங்கேற்கிறேன். எந்த காரணத்தினாலும், எந்த கட்டத்திலும்,எந்த சட்டசிக்கலுக்கும் உட்படாமல் இந்த ஆய்விலிருந்து விலகிக்கொள்ளலாம் என்றும் அறிந்துக் கொண்டேன். நான் ஆய்விலிருந்து விலகிக்கொண்டாலும் ஆய்வாளர் என்னுடைய மருத்துவ அறிக்கைகளைப் பார்ப்பதற்கோ அல்லது உபயோகிக்கவோ என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். என்னைப் பற்றிய தகவல்கள் ரகசியமாகப் பாதுகாக்கப்படும் என்பதைஅறிவேன்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும் பரிசோதனை முடிவுகளையும்,ஆய்வாளர் அவர் விருப்பத்திற்கேற்ப எவ்விதமாகப் பயன்படுத்திக் கொள்ளவும் அதை பிரசுரிக்கவும் என் முழுமனதுடன் சம்மதிக்கிறேன்.

இந்த ஆய்வில் பங்குக்கொள்ள ஒப்புக்கொள்கிறேன்.எனக்குக் கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்துக் கொள்வதுடன் ஆய்வாளருக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதியளிக்கிறேன்.என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லது எதிர்பாராத வழக்கத்திற்கு மாறான நோய்க்குறி தென்பட்டாலோ உடனே அதை தெரிவிப்பேன் என உறுதி கூறுகிறேன். இந்த ஆய்வில் எனக்கு எவ்வித மற்றும் அனைத்துப் பரிசோதனைகளையும் சிகிச்சைகளையும் மேற்கொள்ள நான் முழுமனதுடன் சம்மதிக்கிறேன்.

நன்றி,

ஆய்வாளர் கையொப்பம் நோயாளியின் கையொப்பம்
(டாக்டர்.சா,சதாசிவம்)

MASTER CHART

S.NO	NAME	IPNO	AGE	SEX	DIAGNOSIS	PROCEDURE	HAND SEWN	STAPLER	DURATION OF PROCEDURE	RETURN OF BOWEL SOUND	FEEDING	HOSPITALIZATION	ANASTAMOTIC LEAK	RETURN TO WORK	MORTALITY
1	boopathy	20219	54	m	ca ascending colon	rt hemicolectomy	yes		3hrs	POD 3	POD5	13 DAYS		5 MONTH	
2	zaheriya	42186	56	f	ca caecum	rt hemicolectomy &iliocolol	yes		2 hrs	POD 2	POD3	9DAYS		6 MONTH	
3	Murugan	46139	63	f	ca ascending colon	rt hemicolectomy&colocolic		yes	2 hrs	POD3	POD3	8 DAYS	present	4 MONTH	
4	savan	30720	50	m	ca colon& obstructive jaundice	hemicolectomy&hepato-jeju	yes		4 hrs	POD 4	POD4	11 DAYS	present		dead
5	renganadhan	21682	58	m	ca ascending colon	rt hemicolectomy		yes	2 hrs	POD2	POD2	9 DAYS		5 MONTH	
6	rajeswari	43768	54	f	ca ascending colon	rt hemicolectomy		yes	2 hrs	POD2	POD2	7 DAYS		4 MONTH	
7	kumar	43098	45	m	appendicular carcinoid	rt hemicolectomy	yes		3 hrs	POD4	POD4	9DAYS		6 MONTH	
8	devakumar	43098	45	m	ca caecum	rt hemicolectomy		yes	2 hrs	POD2	POD3	8 DAYS		4 MONTH	
9	velu	43780	34	m	ca caecum	rt hemicolectomy	yes		3 hrs	POD2	POD4	10 DAYS	present	6 MONTH	
10	kumerasan	43124	45	m	appendicular carcinoid	rt hemicolectomy	yes		3 hrs	POD4	POD4	9DAYS		6 MONTH	
11	kaliammal	24791	70	f	ca rectum	low anterior resection	yes		3hrs	POD3	POD3	9DAYS		6 MONTH	
12	laskshmi	32925	23	f	ca rectum	low anterior resection		yes	2hrs	POD 3	POD3	7 DAYS		3 MONTH	
13	palani	43768	67	m	ca rectum	low anterior resection	yes		2 hrs	POD 3	POD3	8 DAYS	present		dead
14	palani	43786	60	m	ca rectum	low anterior resection	yes		2 hrs	POD 3	POD3	8 DAYS		7 MONTH	
15	sathyavani	41557	43	f	ca rectum	low anterior resection	yes		2 1/2 hrs	POD3	POD3	7 DAYS		6MONTH	
16	kumaran	4E+05	22	m	ca rectum	low anterior resection	yes		2 1/2 hrs	POD 3	POD3	9 DAYS		6 MONTH	
17	saroja	50283	55	f	ca rectosigmoidal growth	low anterior resection	yes		3 hrs	POD3	POD3	10 DAYS		5 MONTH	
18	tamilarasan	34425	27	m	ca rectum	low anterior resection		yes	2 hrs	POD2	POD2	8 DAYS		5MONTH	
19	uthian	347 91	59	m	ca rectum	low anterior resection		yes	2 hrs	POD2	POD2	7 DAYS		4MONTH	
20	malar	30876	50	m	ca rectum	low anterior resection	yes		1 1/2 hrs	POD2	POD2	9 DAYS	present	6 MONTH	
21	ashok	27860	37	m	ca rectum	low anterior resection		yes	2 hrs	POD2	POD5	8 DAYS		5MONTH	
22	arumai gandhi	20338	40	m	recto sigmoidal growth	low anterior resection	yes		3 hrs	POD3	POD4	9 DAYS		6MONTH	
23	velayudham	43059	53	m	recto sigmoidal growth	low anterior resection	yes		3 hrs	POD3	POD4	9 DAYS		5 MONTH	
24	velayudham	43059	53	m	recto sigmoidal growth	low anterior resection	yes		3 hrs	POD3	POD4	9 DAYS		6 MONTH	
25	venugopal	42887	40	m	ca rect sigmoidal growth	low anterior resection		yes	2 hrs	POD2	POD3	7 DAYS		4MONTH	
26	manikkam	45098	62	m	ca rectum	low anterior resection	yes		3 hrs	POD3	POD4	8 DAYS		6MONTH	
27	raman	43089	68	m	ca rectum	low anterior resection	yes		2 hrs	POD4	POD4	9 DAYS		5MONTH	
28	kuppuswamy	49087	57	m	ca rectosigmoidal growth	low anterior resection		yes	1 1/2 hrs	POD3	POD3	8 DAYS		4MONTH	
29	elumalai	30987	46	m	GISTstomach	total gastrectomy&oj	yes		3 hrs	POD2	POD3	IODAYS		6MONTH	
30	ramaswamy	45789	67	m	ca stomach	total gastrectomy&oj	yes		3 hrs	POD4	POD4	9DAYS		5MONTH	
31	manjula	45098	45	f	ca stomach	total gastrectomy&oj	yes		2 hrs	POD3	POD4	8 DAYS		6MONTH	

32	venkadesh	32154	45	m	ca stomach	total gastrectomy&oj		yes	2 hrs	POD3	POD3	7 DAYS		4MOTH	
33	shakthi	24153	24	f	ca stomach& goo	total gastrectomy&oj		yes	2 hrs	POD2	POD3	7 DAYS		4MONTH	
34	anunaradeep	23893	75	m	ca stomach	total gastrctomy&oj	yes		2 hrs	POD3	POD4	9 DAYS		5MONTH	
35	palani	29575	57	m	ca stomach	total gastrectomy&oj		yes	3 hrs	POD2	POD3	7 DAYS		4MONTH	
36	sundar	27393	55	m	ca stomach	total gastrectomy&oj	yes		3 hrs	POD4	POD3	8 DAYS	present	4MONTH	
37	raja	30573	70	m	ca stomach	total gastrectomy&oj	yes		2 hrs	POD3	POD3	7 DAYS		5MONTH	
38	chelliah	20996	70	m	ca stomach	total gastrectomu&oj	yes		2 hrs	POD2	POD2	7 DAYS		6MONTH	
39	velu	33153	45	m	ca stomach	total gastrectomy&oj		yes	2 hrs	POD2	POD2	7 DAYS		5MONTH	
40	arumugam	32980	65	m	GISTstomach	total gastrectomy&oj		yes	2 hrs	POD2	POD2	6 DAYS	present	4MONTH	
41	krishnan	35689	36	m	ca stomach	total gastrectomy&oj		yes	1 1/2 hrs	POD2	POD2	6 DAYS		4MONTH	
42	rukmanantham	35782	56	m	ca stomach	total gastrectomy&oj		yes	2 hrs	POD3	POD3	5 DAYS		5MONTH	
43	periayammal	36164	55	f	ca stomach	total gastrectomy&oj	yes		2 hrs	POD2	POD2	8 DAYS		6MONTH	
44	kuppuswamy	52001	87	m	ca stomach	total gastrectomy &oj		yes	3 hrs	POD 2	POD2	5 DAYS		4MONTH	
45	kasinathan	43958	50	m	GISTstomach	total gastrectomy&oj	yes		2 hrs	POD2	POD4	7 DAYS		7MONTH	
46	kanchana	43055	37	f	ca stomach	total gastrectomy&oj		yes	2 hrs	POD2	POD3	8 DAYS		4MONTH	
47	nagammaI	50595	65	f	ca stomach	total gastrectomy&oj	yes		3hrs	POD 3	POD3	8DAYS		6MONTH	
48	chellammal	46226	45	f	periampullary growth	whippls procedure		yes	4 hrs	POD 2	POD2	8 DAYS		7MONTH	
49	lingammal	40446	60	f	periampullary growth	whippls procedure		yes	3 hrs	POD 3	POD3	11DAYS	present	5MONTH	
50	lakshmanan	41253	51	m	periampullary growth	whippls procedure		yes	3 hrs	POD3	POD3	11 DAYS		5MONTH	
51	zorunya	42186	56	m	periampullary growth	whippls procedure	yes		5hrs	POD 4	POD4	13 DAYS		6MONTH	
52	kaveri	34571	48	f	periampullary growth	whippls procedure	yes		4 1/2 hrs	POD 4	POD4	12 DAYS		7MONTH	
53	kalaiselvi	50945	45	f	periampullary growth	whippls procedure	yes		4 1/2 hrs	POD 4	POD4	13 DAYS	present	8MONTH	
54	nithya	39122	48	f	periampullary growth	whippls procedure		yes	3 hrs	POD2	POD2	12 DAYS		5MONTH	
55	rathinam	46273	75	m	periampullary growth	whippls procedure	yes		5 hrs	POD 3	POD3	12 DAYS	present	6MONTH	
56	muniayappan	36739	60	m	ca head of pancreas	whippls procedure	yes		5 1/2 hrs	POD 4	POD4	14 DAYS	present	6MONTH	dead
57	poongavanam	25639	60	f	periampullary growth	whippls procedure		yes	3 hrs	POD3	POD3	11 DAYS		4MONTH	
58	sundaiyammal	34213	38	f	ca head of pancreas	whippls procedure	yes		5 hrs	POD 5	POD6	12 DAYS		6MONTH	
59	jennifer	17266	55	f	ca head of pancreas	whippls procedure		yes	3 hrs	POD3	POD5	11 DAYS	present	5MONTH	
60	laskhmanan	41253	51	m	periampullary growth	whippls procedure		yes	4 hrs	POD4	POD3	10 DAYS		5MONTH	
61	suseela	25431	54	f	ca head of pancreas	whippls procedure	yes		5 hrs	POD4	POD5	13 DAYS	present	6MONTH	
62	chettu	43621	35	m	periampullary growth	whippls procedure		yes	4 hrs	POD2	POD4	10 DAYS		4MONTH	
63	sannasi	47089	56	m	ca head of pancreas	whippls procedure		yes	3 hrs	POD3	POD4	8DAYS		5MONTH	
64	saroja	43098	59	f	periampullary growth	whippls procedure		yes	3 hrs	POD2	POD3	9DAYS	present	5MONTH	
65	narmadha	40123	34	m	ca stomach	subtotal gastrectomy&GJ&JJ		yes	2 hrs	POD3	POD3	7 DAYS		4MONTH	
66	devi	43987	46	f	ca stomach	subtotal gastrectomy&GJ&JJ	yes		3 hrs	POD3	POD4	10 DAYS		6MONTH	
67	karunai mozhi	43078	37	f	ca stomach	subtotal gastrectomy&GJ&JJ		yes	2 hrs	POD2	POD2	9 DAYS		5MONTH	
68	kannagi	43089	34	f	ca stomach	subtotal gastrectomy&GJ&JJ		yes	3 hrs	POD2	POD3	7 DAYS		4MONTH	
69	murugesan	45324	34	m	ca stomach	subtotal gastrectomy&GJ&JJ	yes		3 hrs	POD2	POD3	9 DAYS		6MONTH	

70	prema	21256	19	f	ca stomach	subtotal gastrectomy&GJ&JJ	yes		2 hrs	POD3	POD3	10 DAYS		5MONTH	
71	perumal	20334	46	m	ca stomach	subtotal gastrectomy&GJ&JJ	yes		3 hrs	POD3	POD3	11 DAYS		6MONTH	
72	sekar	30430	50	m	ca stomach	subtotal gastrectomy&GJ&JJ		yes	2 hrs	POD2	POD2	8 DAYS		4MONTH	
73	govindaswamy	31504	60	f	ca stomach& goo	subtotal gastrectomy&GJ&JJ	yes		2 1/2	POD3	POD3	10 DAYS	present		dead
74	chinna ponna	30595	58	f	ca stomach	subtotal gastrectomy&GJ&JJ		yes	1 hrs	POD2	POD2	8 DAYS	present	4MONTH	
75	elumalai	34671	67	m	ca stomach	subtotal gastrectomy&GJ&JJ		yes	2 hrs	POD2	POD2	8 DAYS		3MONTH	
76	thangavalli	31594	55	f	ca stomach	subtotal gastrectomy&GJ&JJ		yes	1 1/2 hrs	POD2	POD2	8 DAYS		4MONTH	
77	selsa	36148	55	f	ca stomach	subtotal gastrectomy&GJ&JJ	yes		2 1/2 hrs	POD 3	POD3	10 DAYS		5MONTH	
78	vijaya	45382	40	f	ca stomach	subtotal gastrectomy&GJ&JJ	yes		3 hrs	POD 3	POD3	11 DAYS	present	6MONTH	
79	chellan	52193	54	m	ca stomach	subtotal gastrectomy&GJ&JJ		YES	2 hrs	POD 2	POD2	9 DAYS		5MONTH	
80	ameer basha	26165	54	m	gastro duodenal growth	limited resection &anastamo		yes	3 hrs	POD3	POD3	8 DAYS		4MONTH	
81	elumalai	22369	68	m	TB sigmoidal sticture	resection &anastamosis		yes	2 1/2hrs	POD 3	POD3	8 DAYS		5MONTH	
82	roja	22610	40	f	mekels diverticulam	resection &anastamosis		yes	1 hrs	POD2	POD3	8 DAYS		4MONTH	
83	mariammal	21893	25	f	TB sigmoidal sticture	resection &anastamosis	yes		3 hrs	POD2	POD3	10 DAYS		6MONTH	
84	jayamma	24020	70	f	caecal mass	limited resection &anastamo	yes		3 hrs	POD3	POD4	9 DAYS		5MONTH	
85	munuswamy	34235	65	m	post apr &ec fistula	resection &anastamosis	yes		2 1/2 hrs	POD3	POD3	9 DAYS	present	6MONTH	
86	munuswamy	34235	65	m	post apr &ec fistula	resection &anastamosis	yes		2 1/2 hrs	POD3	POD3	9 DAYS	present	5MONTH	
87	vennila	43657	43	f	mesentric cyst	resection &anastamosis		yes	3 hrs	POD2	POD3	8 DAYS		4MONTH	
88	anandan	32543	34	m	ileo-cacal mass	limited resection &anastamo		yes	2 hrs	POD3	POD3	8 DAYS		3MONTH	
89	annamalai	43768	54	m	ca og junction	resection &anastamosis		yes	2 hrs	POD2	POD3	9 DAYS		3MONTH	
90	prem kumar	40987	36	m	ileo-cacal mass	limited resection &anastamo	yes		3 hrs	POD2	POD4	10 DAYS		5MONTH	
91	menatchi	32098	56	m	TB sigmoidal sticture	resection &anastamosis	yes		3 hrs	POD3	POD4	11 DAYS	present	5MONTH	
92	kuppan	43209	56	m	intussuption&rif mass	limited resection &anastamo	yes		4 hrs	POD4	POD4	9 DAYS	present	4MONTH	
93	murugan	40997	34	m	mekels diverticulam	resection &anastamosis	yes		3 hrs	POD3	POD4	10 DAYS		5MONTH	
94	kannan	45908	63	m	sigmoid growth	resection &anastamosis	yes		3 hrs	POD4	POD3	9 DAYS	present	5MONTH	
95	Murugan	44275	35	m	gatric outlet obstruction	trunkal vagotomy &GJ	yes		2hr	POD 2	POD2	5 DAYS		4MONTH	
96	ayyakannu	22890	62	m	goo	trunkal vagotomy &GJ	yes		2 hrs	POD2	POD3	7 DAYS		3MONTH	
97	chadra prabhu	29011	67	m	ca head of pancreas	triple by pass surgery		yes	2 hrs	POD3	POD3	10 DAYS			dead
98	ganesh	51578	23	m	post ileostomy status	ileostomy closure	yes		1 hrs	POD2	POD2	5 DAYS		5MONTH	
99	chella durai	47271	50	m	post ileostomy status	ileostomy closure	yes		1 hrs	POD2	POD3	6 DAYS		5MONTH	
100	lalitha	40796	29	f	ca stomach	anterior gj&jj	yes		2 1/2 hrs	POD2	POD2	5 DAYS		5MONTH	

INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work	: A Comparative study on the outcome of stapler Anastomosis and Hand sewn Anastomosis in Elective Gastro intestinal Surgeries
Principal Investigator	: Dr.S.Sadasivam
Designation	: PG in M.S (Gen.Sur)
Department	: Department of Gen.Sur Government Stanley Medical College, Chennai-1

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 06.03.2012 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

01/11/12

MEMBER SECRETARY,
IEC, SMC, CHENNAI

PROFORMA

A Comparative study on the outcome of Stapler Anastomosis and Hand sewn Anastomosis in Elective Gastro intestinal Surgeries

Investigator: **Dr.SADASIVAM.S**, PGY2 – MS (Gen Surg)

Guide: **Prof. Dr. R.KUMAR** Chief, Unit S3

Name: **Age/ Sex:** **I.P. No.:**

Address: **Contact no:**

D.O.A: **D.O.D:**

CHIEF COMPLAINTS AND RELEVANT HISTORY:

VITAL SIGNS:

SYSTEMIC EXAMINATIONS:

CVS/RS/CNS/ABDOMEN:

LOCAL EXAMINATION:

Investigations:

HEMAT			**LFT**		
HB			T.BIL		
PCV			D.BIL		
RBC			AST		
TC			ALT		
DC			ALP		
PLT			T.PROTEIN		
ESR			S.ALB		
RBS FBS PPBS					
B.UREA					
S.CREAT					
S.Na+					
S.K+					
S.Cl-					
S.HCO3-					

X RAY	
ECG/ECHO	
USG-ABDOMEN	

CECT ABDOMEN				
M.R.I SCAN				

DIAGNOSIS:

PROCEDURE AND DETAILS:

1. **ANASTHESIA**
2. **NAME OF THE SURGERY**
3. **NO OF ANASTOMOSES,ANASTAMOTIC SITE, AND ITS TYPE**
4. **PER OPERATIVE EVENTS AND DURATION**
5. **POST OPERATIVE FOLLOW UP**

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INTRODUCTION

In gastro intestinal surgery after rection of bowel loops, anastamosis of the bowel loops is the central part of the gastro entrology. Sero muscular suture technique is the main stay of the Gastro intestinal sugery which is described lembert in 1826 .

single layer extra mucosal anastamosis is the more commenly used now a days which is described by Matheson of Aberdeen because of which has the capacity to produced least tissue necrosing or luminal narrowing.which has to replaced to catgut and silk now a days

The stapler devices recently introduced and this helps anastamosis of